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United States Department of the Interior
Bureau of Land Management
Elko District Office October 7, 1993

ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-93/036

MILL CANYON EXPLORATION PLAN OF OPERATIONS

File: N16-92-001P

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FINDING OF NO SIGNIFICANT IMPACT
AND
DECISION RECORD
Mill Canyon Exploration Plan of Operations
BLM/EK/PL-93/036
(3809) N16-92-001P

Finding of No Significant Impact

Based on the analysis of potential environmental impacts contained in the Environmental Assessment BLM/EK/PL-93/036, I have determined that the action will not have a significant effect on the human environment, and therefore, an environmental impact statement is not required.

Decision

It is my decision to authorize the Mill Canyon Exploration Plan of Operations, Bureau of Land Management (BLM) casefile N16-92-001P, for Santa Fe Pacific Mining, Inc., (SFPM) as described in the Proposed Action of BLM/EK/PL-93/036. Approval of SFPM's operations is contingent on meeting all stipulations and monitoring requirements listed below.

Stipulations

1. SFPM will, to the extent practicable, limit damage to or removal of limber pine trees. If damage to or removal of such a tree is found to be necessary, it will not occur without prior notification of the BLM authorized officer. Within five calendar days, weather permitting, the BLM authorized officer will issue a decision concerning this proposed damage to or removal of limber pine trees. The decision will be in conformance with the Environmental Assessment and prevent undue or unnecessary degradation to the environment.

2. SFPM will practice avoidance of all cultural resources until the historical context and National Register eligibility have been determined. If any particular cultural resource is determined eligible, the proposed disturbance will be relocated and demonstrated that no resource conflict exists, or SFPM will comply with all appropriate regulations prior to impacting the site.

Monitoring

1. SFPM will monitor impacts of the proposed exploration to the surface water quality flowing in Mill Canyon. If historic tailings are disturbed, they will be relocated or removed in accordance with any applicable laws, and in cooperation with the BLM and Nevada Department of Environmental Protection.

2. SFPM will monitor indirect impacts to selected cultural resources in Mill Canyon. SFPM will develop information on baseline conditions and establish a monitoring schedule. SFPM will report to the BLM any observed acts of cultural resource vandalism, and the apparent results of such vandalism.

3. Standard Bureau inspection procedures will be used during the exploration project and reclamation. Initial and periodic inspections of the project will be made by the BLM. Any deficiencies noted by the BLM will be discussed with SFPM, and specific measures to correct any problems will be developed by SFPM. Periodic surveys will be conducted by the BLM to determine site stability and success.

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Rationale

As a result of the analysis in the Mill Canyon Exploration Plan of Operations, the Environmental Assessment determined that the Proposed Action does not result in any undue or unnecessary environmental degradation on the environment. The Proposed Action will allow SFPM to explore for precious, mineral-bearing deposits in the defined project area. The No Action alternative was not selected because SFPM would not be able to explore for minerals.

The Proposed Action is in conformance with the Elko Resource Management Plan; Issues-Minerals, Management Prescription-No. 1, and is consistent with Federal, State, and local laws, regulations and plans.

Russell T. Dailey

Russell T. Dailey, Manager
Elko Resource Area

10-12-93

Date

United States Department of the Interior
Bureau of Land Management
Elko District Office

October 7, 1993

ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-93/036

MILL CANYON EXPLORATION PLAN OF OPERATIONS

File: N16-92-001P

MILL CANYON EXPLORATION PROJECT
ENVIRONMENTAL ASSESSMENT
BLM/EK/PL-93/036

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Chapter One. INTRODUCTION / PURPOSE AND NEED

1.1 Introduction

Santa Fe Pacific Mining, Incorporated (SFPM), proposes to conduct exploratory drilling in the vicinity of Mill Canyon, located 14 miles south of the town of Crescent Valley, in north-central Nevada (Figures 1-1 and 1-2). The project area includes 4,424 acres of public land administered by the Bureau of Land Management (BLM) and 246 acres of private lands. Most of the project area lies within Eureka County and the Elko BLM District. However, the extreme northwest corner of the project area extends into Lander County and the Battle Mountain BLM District.

SFPM is currently conducting exploration activities in the Mill Canyon area under BLM Notices of Intent N16-91-19N (Mill Canyon Pediment), N16-91-08N (Lower Mill Canyon), N16-91-41N (Emma E), N16-91-31N (Chute), N16-91-07N (Thrust), and N16-91-40N (Tenabo Projects). As part of its Plan of Operations, SFPM proposes that disturbance created under the aforementioned notices be incorporated into the Mill Canyon project and that the earlier files be closed.

1.2 Purpose and Need

The purpose of the proposed project is to explore for precious metal-bearing deposits in the project area. The project need is to define the exact location, shape, and economic value of any precious metal deposits present.

1.3 Issues

On August 14, 1992, the BLM Elko District Office initiated a 30 day public scoping period and issued a news release to news organizations in the states of Nevada, Idaho, and Utah. The public scoping was to solicit comments and concerns for SFPM's proposed exploration plan. In conjunction with reviews conducted by BLM specialists, the following issues were identified.

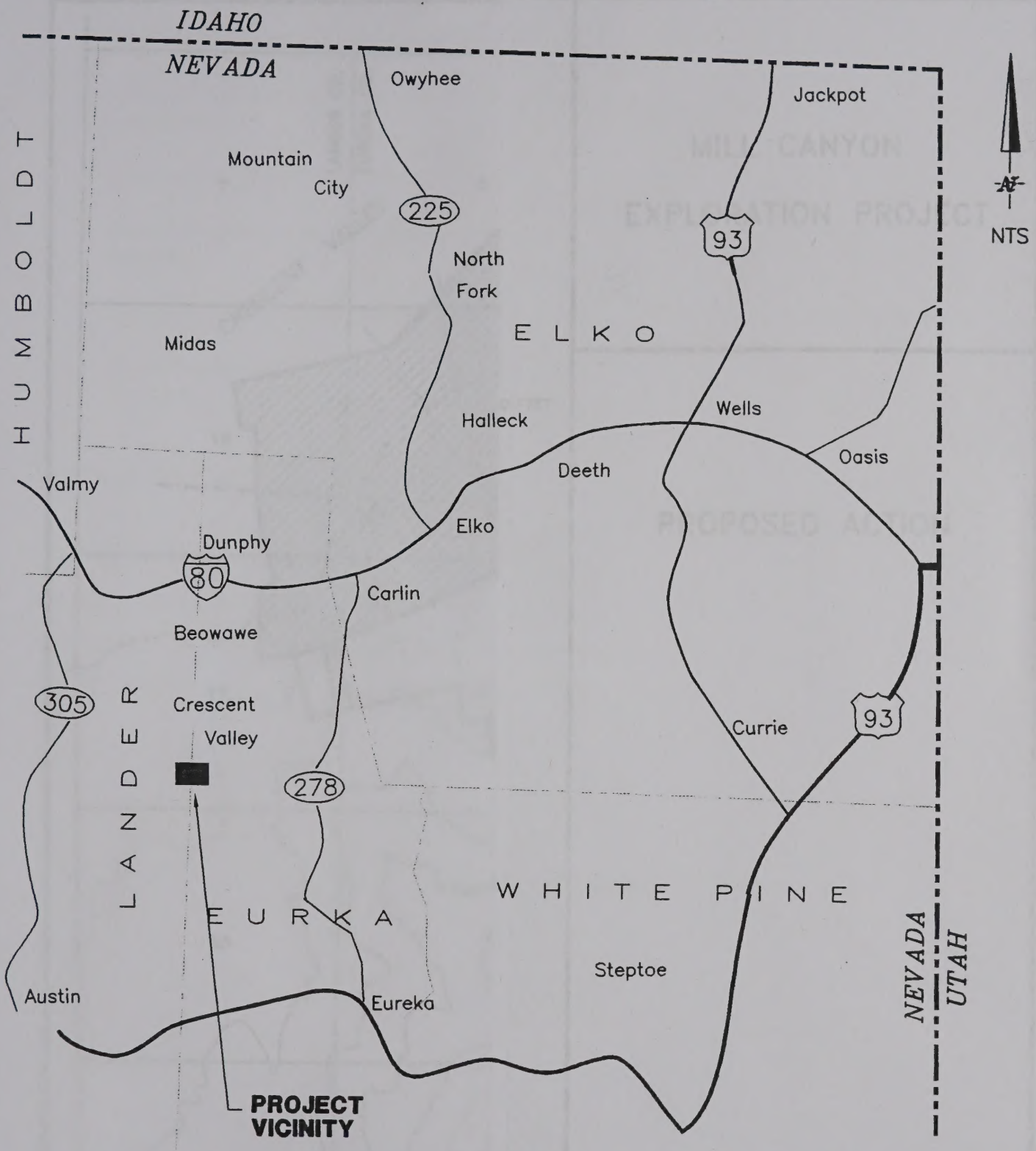
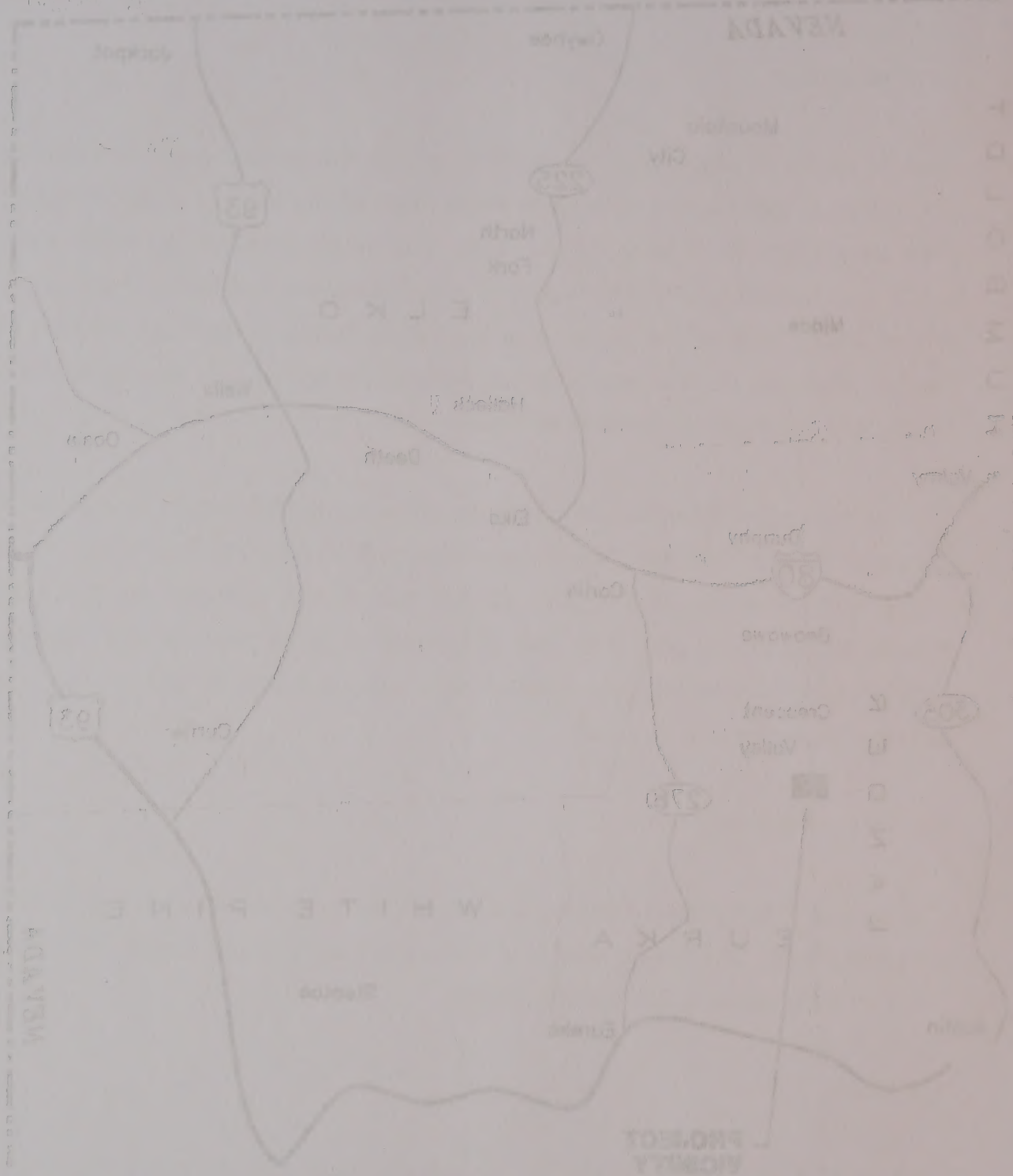
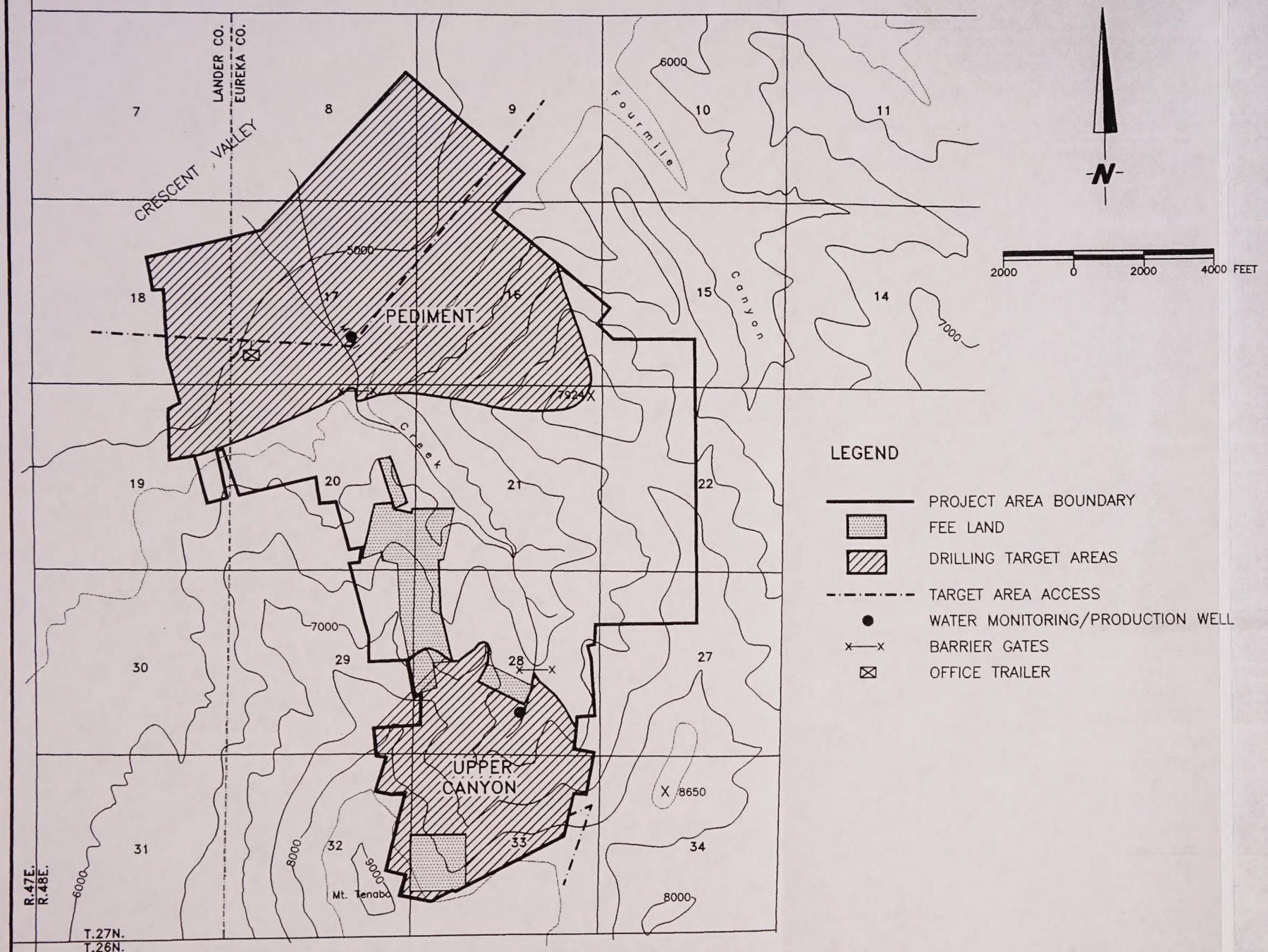


FIGURE 1-1 MILL CANYON EXPLORATION PROJECT VICINITY MAP



MILL CANYON EXPLORATION PROJECT

PROPOSED ACTION



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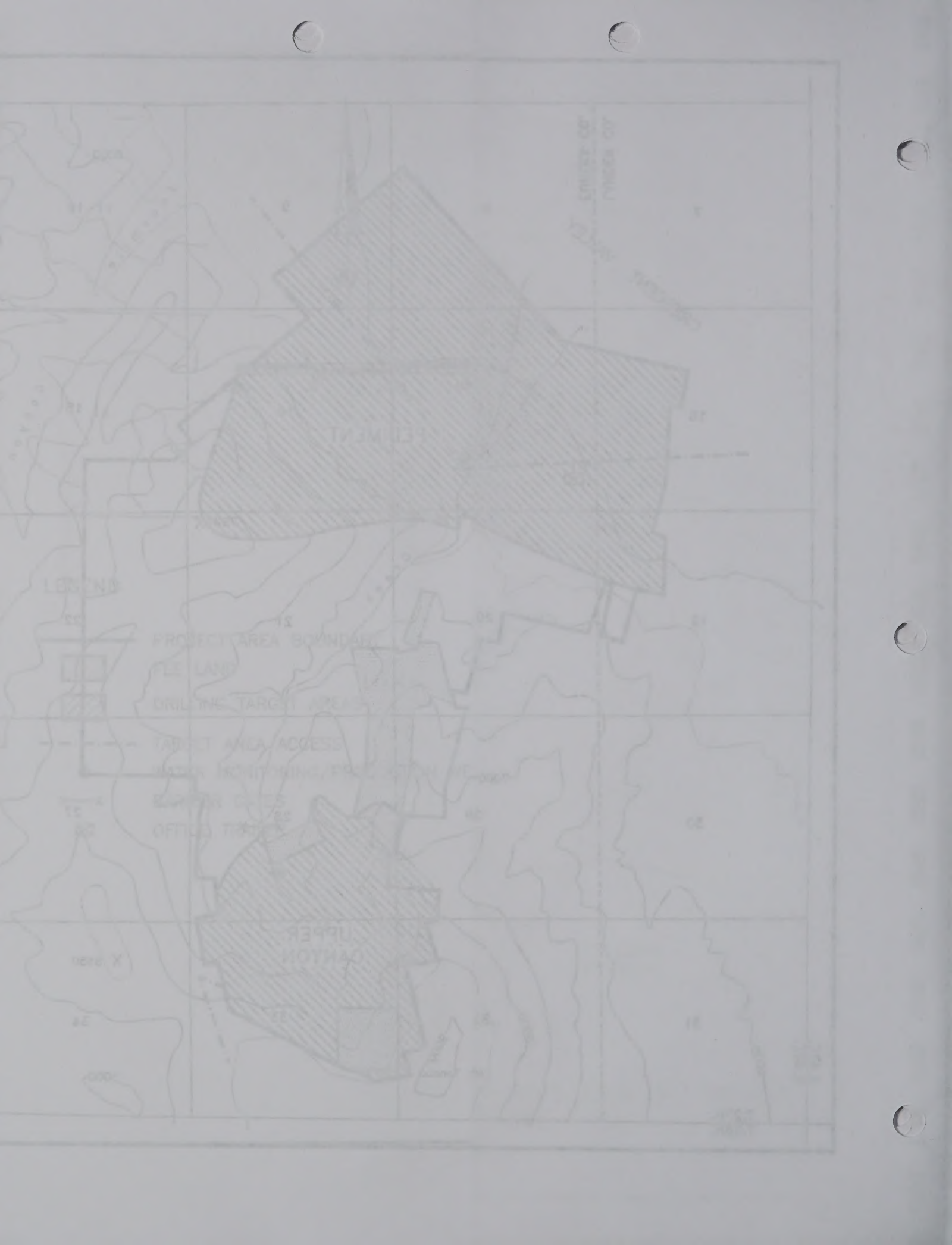
LEGEND

- PROJECT AREA BOUNDARY
- FEE LAND
- DRILLING TARGET AREAS
- TARGET AREA ACCESS
- WATER MONITORING/PRODUCTION WELL
- BARRIER GATES
- OFFICE TRAILER

FIGURE 1-2



- Potential impacts to surface hydrology, and surface and groundwater quality.
- Potential impacts to soils, vegetation, riparian and wetland areas, and range resources.
- Potential impacts to wildlife.
- Potential impacts to threatened, endangered, or candidate species of plants and animals.
- Potential impacts to identified National Register eligible cultural resources.
- Potential visual impacts associated with the proposed introduction of new landscape features.

1.4 Land Use Plan Conformance Statement

The Proposed Action and alternatives described below are in conformance with the Elko Resource Management Plan; Issue - Minerals, Management Prescription #1, and are consistent with Federal, State, and local laws, regulations, and plans to the maximum extent possible.

Chapter Two. PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

SFPM submitted a Final Plan of Operations to the BLM on February 9, 1993. SFPM proposes to drill a maximum of 904 exploration drill sites during the 1993, 1994, 1995, 1996, and 1997 field seasons. Many sites would not require drill pad construction; these sites would be drilled from existing roads without the need for blading, and some sites could be used for two or more holes. For the purpose of disturbance calculations and reclamation responsibilities, each site has been assigned a disturbance area of 5,000 square feet, representing a 100 by 50 foot drill pad.

Depending on the success of the exploration program, some or all of the proposed drill sites and access roads would be constructed. For purposes of this environmental assessment, it is assumed that all proposed activities would occur. Exploratory drilling would occur in two areas, the Pediment and Upper Canyon (Figures 2-1 and 2-2). The Mill Canyon exploration project would involve a maximum of 239.2 acres of surface disturbance, 93.4 acres of which is attributable to drill, well, and support site construction, and 145.8 acres of which is attributable to access road construction (Table 2-1). These disturbance figures include previously permitted SFPM exploration activities in the area. Prior non-SFPM mining activities have resulted in approximately 129.5 acres of disturbance within the Mill Canyon watershed.

As shown on Figures 2-1 and 2-2, eight zones have been delineated within the project which are intended to show areas of closely spaced drill sites. Each delineated zone encompasses approximately 3.67 acres (400 by 400 feet) of surface area, and would be drilled on either 50 or 100 foot centers. These zones would contain 368 of the proposed 904 exploration drill sites. Again, for the purposes of estimating reclamation costs, these eight zones are assumed to be totally disturbed.

PROJECT BOUNDARY

DRILL HOLES:

- EXISTING WATER MONITORING/PRODUCTION SITE: 1 SITE
- PROPOSED WATER MONITORING/PRODUCTION SITE: 1 SITE
- RECLAIMED DRILL SITE: 6 SITES
- EXISTING DRILL SITE: 74 SITES
- PROPOSED DRILL SITE: 536 SITES
- PROPOSED 400'x400' ZONE OF DRILLING WITH 50' SPACING: 3 ZONES @ 81 HOLES EACH=243 HOLES
- PROPOSED 400'x400' ZONE OF DRILLING WITH 100' SPACING: 5 ZONES @ 25 HOLES EACH= 125 HOLES

ACCESS CONSTRUCTED PRIOR TO 1981:

- RECLAIMED
- NOT RECLAIMED
- RECLAIMED, TO BE REOPENED BY SFPM

ACCESS BY PREVIOUS OPERATOR:

- RECLAIMED
- NOT RECLAIMED
- RECLAIMED, TO BE REOPENED BY SFPM

ACCESS CONSTRUCTED BY SFPM:

- RECLAIMED
- NOT RECLAIMED
- CROSS COUNTRY TRAIL BY SFPM, NOT RECLAIMED
- PROPOSED

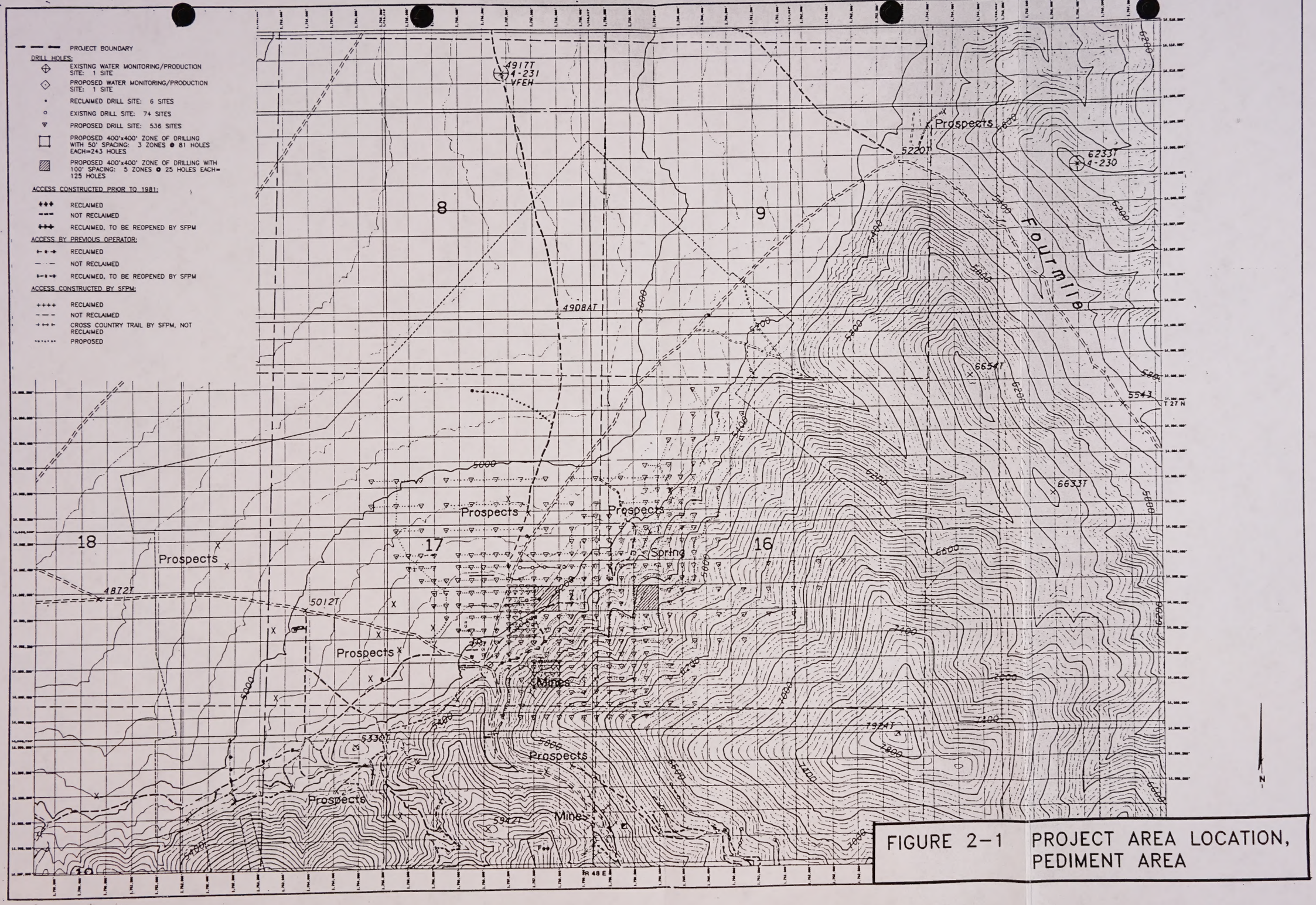


FIGURE 2-1 PROJECT AREA LOCATION, PEDIMENT AREA

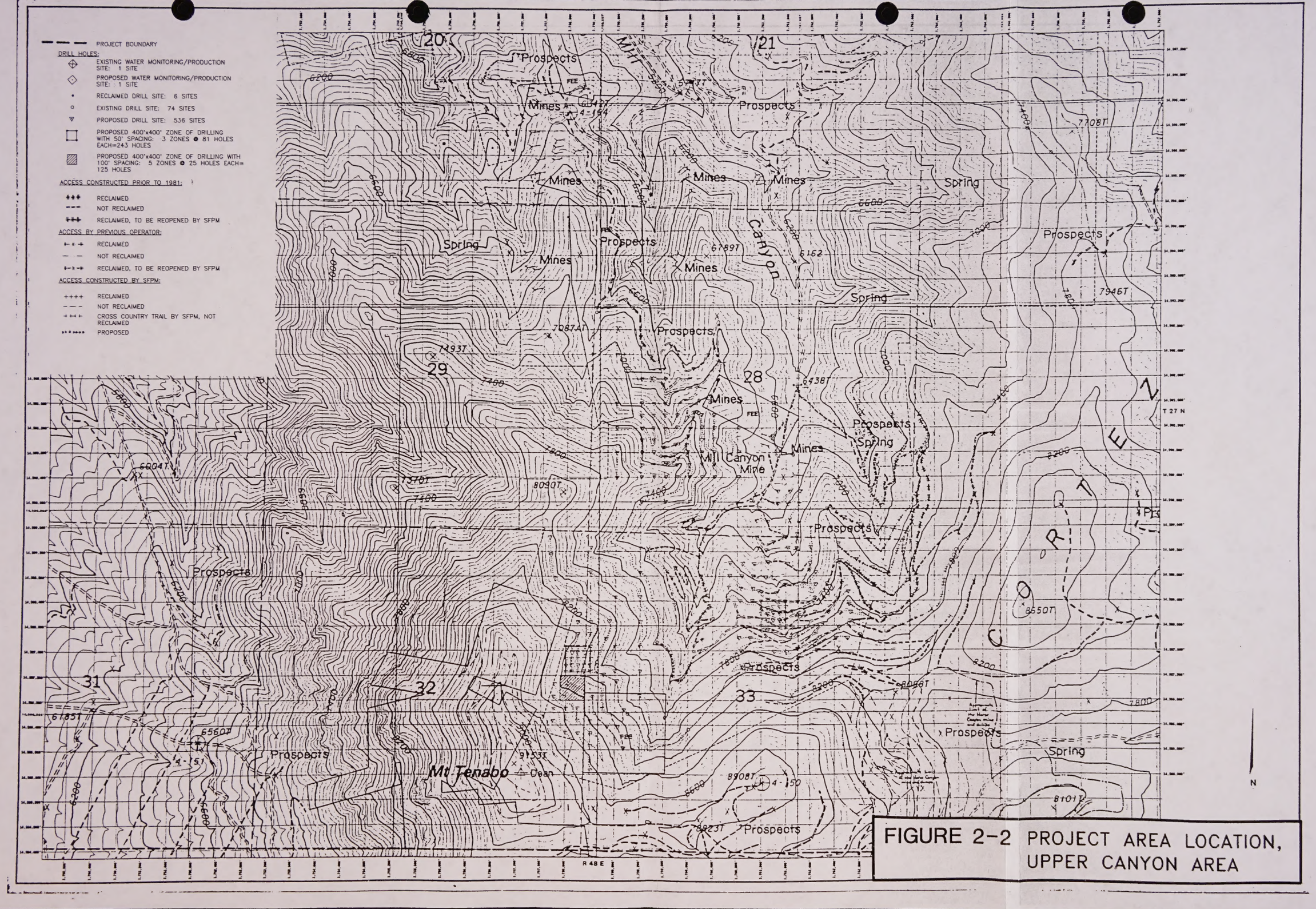


FIGURE 2-2 PROJECT AREA LOCATION, UPPER CANYON AREA

Table 2-1: Estimated Project Area Disturbance

Disturbance Phase	Drill and Support Sites		Roads		Total (Acres)
	No.	Acres	Linear Feet	Acres	
Notice Federal Surface	69	2.7	18,790	12.8	15.5
Notice Fee Surface	5	0.3	3,760	3.0	3.3
Proposed Federal Surface	887	90.6	153,350	123.3	213.9
Proposed Fee Surface	21	2.4	5,120	4.1	6.5
					239.2

Source: Santa Fe Pacific Mining, Inc., Mill Canyon Project Plan of Operation dated 2/8/93.

Two production wells would be constructed as part of the Proposed Action, one near the head of the canyon and the other near the mouth of the canyon, (see Figure 1-2). Water derived from the wells will be used during drilling operations and for fugitive dust control. Each production well site would require construction of a 50 by 50 foot bentonite sealed pond to store a sufficient reserve of water to fill more than one truck at a time. The first well and pond, located in the southern portion of Section 28, would both be in one area measuring 150 by 250 feet (37,500 square feet). The second well and pond, located in the southeast portion of Section 17, would be on separate sites and connected with PVC pipe. Combined disturbance area for both the well and the pond would not exceed 37,500 square feet. SFPM may convert one or both of the wells to a groundwater monitoring location. Because Crescent Valley is a designated groundwater basin, a water right permit or a waiver would be required from the Nevada Division of Water Resources (NDWR) prior to the drilling of any wells. If drilled under a waiver, the NDWR must also issue a water right permit before any of the water is used. In this particular basin the NDWR would consider applications for mining and milling purposes as a preferred use due to the temporary nature of the manner of use.

A previously permitted support area located in the southwest corner of Section 17, measuring 150 by 100 feet (15,000 square feet), would be used as an office trailer, logging trailer, and mud van site ("Support Site #1" in disturbance and reclamation tables). A second support area of the same dimensions, located in the east central portion of Section 28, would be used as an office trailer and logging trailer site ("Support Site #2" in disturbance and reclamation tables). One 5,000 square foot site in the central portion of section 33 would be used as a mud van and drillers' supply area ("Support Site #3" in disturbance and reclamation tables).

A maximum of approximately 158,470 linear feet of access would be required to reach sites not accessible by cross-country travel. Approximately 148,690 linear feet would be new access construction and approximately 9,780 linear feet would be reconstruction of previously reclaimed roads. The width of road disturbance would be approximately fifteen feet in the flat alluvial terrain and up to forty-five feet in the steep mountainous terrain due to the side cast and cut banks required on steep slopes. An average disturbance width of 35 feet was used for disturbance acreage calculations.

There would be a need for flexibility of road and drill site placement nature of exploration drilling. This would be especially true for the eight proposed zones of intensive drilling. These zones are depicted in areas expected to require additional exploration, however, the exact location of these zones would depend entirely on data acquired during exploration. The proposed disturbance shown on the attached map is intended to be an accurate estimation of what would be needed to accomplish this exploration. SFPM expects some deviations in actual site locations and road alignments in order to meet subsurface exploration needs. The order in which the sites would be drilled would be determined on the basis of the lithologic and assay results as the exploration progresses.

2.1.1 Access

Access to the project area would be via Interstate Highway 80 approximately 30 miles east of Battle Mountain, Nevada. Exit Interstate 80 at the Beowawe exit and proceed south-southwest for approximately 25.2 miles on Highway 306. At the intersection of Highway

306 and the Cortez Mine access road turn southeast and proceed approximately six miles on the Cortez Mine access road. At the Grass Valley Road intersection, turn left (north) and proceed one mile. Turn right (south-east) on the dirt road and proceed three miles to the mouth of Mill Canyon.

A secondary entry route would access the southern portion of the project area. Proceed as described to the Grass Valley Road. Turn right (south) on this road and continue through Cortez Canyon to the intersection with the main access to the Horse Canyon Mine. Proceed on the mine access road past the pit area, continuing up the southern flank of Mount Tenabo. The project lies over the crest.

In order to provide for human safety, two gates would be utilized to restrict public access to the project area until the proposed action is completed. The gates would be located at the entrance to Mill and Horse canyons and would serve to minimize the potential of exposing recreational users of the public land to hazardous conditions created by the increased amount of traffic on narrow, obstructed roads. The gates would also serve as securement of numerous historical adits and shafts which are presently in the project area.

No reconstruction of access routes to the project area would be necessary. Maintenance and dust control measures would be performed as needed. Dust control would consist of spot graveling and watering access roads as needed to comply with fugitive dust standards.

2.1.2 Construction Techniques

Construction would begin on access roads to the first sites to be drilled which cannot be accessed by cross country methods or existing roads. Drill sites would be leveled if necessary. All road and drill site construction would use the following techniques to minimize the area of disturbance, minimize soil erosion and maximize revegetation potential.

- Existing access would be used to the greatest extent possible.

- New disturbance would be kept to the minimum necessary for safe access and a safe working area for equipment and crew.
- Cross country travel and off-road activities would be used wherever possible to minimize disturbance.
- Access roads within the project area would be constructed close to the contour with typical grades of zero to fifteen percent. Fifteen to twenty percent grades would only be necessary if an obstruction, such as rock outcrop, is encountered and there is no other practical route to a specific site. No roads greater than twenty percent would be constructed.
- Topsoil would be saved and stockpiled as sidecast fill material for reclamation purposes, except in areas as approved by the authorized BLM officer.
- Disturbed areas would be broadcast seeded, if necessary, to minimize erosion.
- Drainage structures would be constructed or installed where necessary to prevent or minimize erosion. Drainage structures would consist of, but not be limited to, the following - waterbars, borrow ditches, and contour furrows. If culverts are determined to be necessary, they would be sized to handle maximum seasonal water flows.
- Road and drill site cut banks would be constructed with the appropriate slope to minimize erosion and visual effects.
- Back-up types switchbacks would be utilized to minimize disturbance.
- Some reconstruction of existing drill roads would be necessary, consisting of minor widening, smoothing, and enlarging the radius of switchback turns to allow drilling equipment to pass.

It is not practical at this point in time to specify the angle of cut-slopes, the location of areas that would need blasting, the specific location of drainage structures, topsoil stockpiles, or slopes that would be seeded to minimize erosion.

SFPM would blast in areas where rock outcrops cannot be avoided in the construction of access roads or drill sites. Blasting activities would consist of drilling blast holes with a trailer mounted air compressor and hand held rock drills, loading holes with explosives, and detonating those explosives. An air track drill or equivalent equipment may be used when hand drills are not capable of penetrating the rock. The minimum amount of explosives necessary would be used to reduce fly rock and excess material being thrown

down slope. Specific blasting times would vary, but generally will occur in the late afternoon. All blasting activities would be done by trained, competent personnel. Signs would be posted along the appropriate access ways and all personnel in the area would be notified before blasting occurs. Roads would be blocked, if necessary, to ensure the area is clear. Explosive materials would be stored, handled and transported in accordance with State and Federal laws.

2.1.3 Exploration Techniques

Once the initial access roads and drill sites have been prepared, drill rigs and support equipment would be moved on site. Depending on hole depth and drilling conditions, each reverse-circulation drill site would normally be occupied for one to five days, while core hole sites could be occupied for fifteen to twenty days. Mud Rotary Sites would be occupied for three to six days. Site personnel would include a driller, one to three helpers, a geologist, and occasionally other personnel. Lithologic and assay samples would be taken during drilling.

2.1.4 Ancillary Facilities and Equipment

The following is a description of all ancillary facilities which may be required for the completion of this project:

2 - 12' x 35' Office trailers with generators;
2 - 12' x 35' Drilling mud storage trailers;
2 - 8' x 30' Logging trailers; and,
Various portable restrooms, as necessary.

The following equipment would be used for maintenance and/or construction of drill pads, access roads and erosion control structures:

3 - D-7 class dozers with rippers (maximum of 14-foot blade width);
2 - 4,000 gal. water trucks for dust control;
2 - air track drills or equivalent for blasting;

2 - air compressors for blasting;
8 - hand drills for blasting; and,
2 - road graders for maintaining roads and water bars.

Types of drill rigs that may be employed include TH-100 class, truck-mounted reverse circulation rigs; Longyear 44 class, truck-mounted wireline core rigs; track-mounted, all terrain, reverse circulation rigs; and 2500 foot class mud rotary rigs. The project would use any combination of the above drill rigs with a maximum of twenty rigs operating at any one time, although three to six rigs would normally be present.

Support equipment present on site may include one to three water trucks (3000 gal. capacity, tandem axle), pipe truck (tandem axle or all terrain), fuel and tool truck (tandem axle or all terrain), and 4x4 pickup trucks for crew and fuel transport. The equipment on site at any given time would support multiple drill rigs.

2.1.5 General Operating Procedures

The following are general procedures SFPM would use to conduct the proposed exploration activities.

- All SFPM project-related traffic would observe prudent speed limits to minimize fugitive dust emissions, protect wildlife and livestock, and enhance public safety.
- All project related refuse would be disposed of on a daily basis at an approved landfill. Each rig crew would be responsible for transporting refuse created by their operations in approved containers. No refuse would be disposed of on site.
- In the event regulated materials such as diesel fuel are spilled, measures would be taken to control the extent of the spill, and the appropriate State and/or Federal agencies would be notified immediately. Corrective actions and clean-up would be completed to applicable State and Federal agency standards.
- All equipment would be properly muffled and equipped with suitable and necessary fire suppression equipment such as fire extinguishers and hand tools.
- All drill holes would be abandoned according to Nevada specifications.

- All activities would be conducted in accordance with Federal and State health and safety requirements.

- SFPM would not modify or place any fill material or dredge in stream beds and will employ sediment controls, as necessary, consistent with State of Nevada's Handbook of Best Management Practices.

2.1.6 Reclamation Procedures

All disturbed areas would be reshaped to a stable condition. SFPM would receive the authorized officer's approval prior to reshaping any disturbance to less than the original contour. This reshaping would be limited to new disturbance created by SFPM and existing roads used by SFPM. SFPM would return the surface to the condition which was present prior to SFPM's activities on all pre-existing, unreclaimed mine related disturbances.

If culverts need to be installed to prevent excessive erosion, SFPM would remove and dispose of all such culverts at an approved landfill. SFPM would construct drainage structures as needed to prevent accelerated erosion. In the event it may be necessary to install drainage structures, SFPM would remove any fill material in drainages and recontour to approximately the original drainage cross section. Rock or rip-rap material would be used to armor reshaped drainages, if necessary, to minimize erosion.

All areas of compacted soil which are accessible to track mounted equipment would be scarified prior to seeding. Scarification would be done during the seeding process. All areas deemed explored/condemned would be reclaimed at the earliest practical time.

SFPM would use a modified rangeland drill mounted on a D-5 class dozer with a six way hydraulic angle blade to scarify and seed disturbed areas. The drill implement is capable of ripping compacted areas to depths of at least 6 inches. Areas too rocky to scarify or too steep to be accessible with track-mounted equipment would be seeded with a hand broadcaster at double the drilled rate of the seed mixture.

The seed mixture proposed for used in the pediment would be as follows:

Species	lbs PLS/acre
Bluebunch Wheatgrass	2.0
Indian Ricegrass	1.0
Basin Wild rye	2.0
Ladak Alfalfa	3.0
Utah Sweetvetch	1.0
Small Burnet	1.0
Four Wing Salt Bush	2.0
Winterfat	1.0
TOTAL SEED:	13.0 lbs PLS/acre drilled

On higher elevations above the pediment, the following seed mixture proposed for use would be:

Species	lbs PLS/acre
Bluebunch Wheatgrass	2.0
Indian Ricegrass	1.0
Basin Wild rye	2.0
Ladak Alfalfa	3.0
Utah Sweetvetch	1.0
Small Burnet	1.0
Prostrate Summer Cypress	1.0
Winterfat	1.0
TOTAL SEED:	12.0 lbs PLS/acre drilled

Reclaimed surfaces would be left in a textured (or rough) condition consisting of numerous small pits, humps, and ridges. These small-scale topographic features would facilitate moisture collection-retention, would help to collect native wind blown seed, and would aid revegetative success while minimizing erosion potential.

SFPM has conducted a study to document cover, frequency, and composition of vegetation communities present in portions of the project area likely to be affected. This study would form the basis for setting reclamation standards. After vegetation data are collected, SFPM

would confer with the BLM and NDEP to determine if the proposed seed mix(es) needs to be modified. Factors to be considered would include, but not be limited to:

- the existing and/or desired plant community;
- its anticipated effectiveness in providing erosion control in the project area;
- its suitability given project-specific aspect, elevation, and soil conditions; and
- the proposed post-project land use plan (livestock grazing, wildlife habitat, etc.).

No trenches, pits, or adits are proposed as part of this plan.

2.1.7 Securement Plan

The project area contains many adits, shafts, pits, and other features which could pose a public safety hazard. These features have not been inventoried or rated, and may or may not have cultural value. The site will be temporarily secured by the use of locked gates to restrict public access and by the signing of hazardous areas. Securement according to NAC Chapter 513 will commence as soon as the features have been inventoried, rated, and a securement plan, prepared by SFPM, has been approved by the NDEP, NDOM, and the BLM.

2.2 No Action Alternative

Under the No Action alternative, the BLM would not approve SFPM's POO to conduct mineral exploration in the defined project area. This would result in a continuation of current agency management practices in the area.

2.3 Alternatives Considered But Eliminated From Detailed Analysis

An access to the Upper Canyon area was considered during initial project planning. This route involves use of the existing road through the canyon bottom and may impact

sensitive resources located there. BLM resource specialists determined that this route conflicted with resource issues and the alternative was rejected from further consideration.

Chapter Three. DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Proposed Action

Mill Canyon is a narrow, steep sided defile which extends approximately two miles into the Cortez Mountains (see Figure 1.1), the northern most extension of the Toiyabe Range. The Canyon is located just north of Cortez Canyon which serves as the divide between the Cortez Mountains and the Toiyabe Range. The most prominent landmark in the Cortez Mountains is Mount Tenabo which reaches an elevation of 9,153 feet. The northeast - southwest tending block is bordered by Crescent Valley to the northwest, Pine Valley to the east, Grass Valley to the south, and the Humboldt River to the north.

The following critical elements of the human environment are not present or are not affected by the Proposed Action or alternatives considered in this EA:

- Areas of Critical Environmental Concern;
- Native American Religious Concerns;
- Prime or Unique Farmlands;
- Wilderness;
- Wild and Scenic Rivers;
- Floodplains; or,
- Wetlands / Riparian Zones.

BLM specialists have further determined that the following resources, although present in the project area, are not affected by the Proposed Action.

- geological resources;
- lands - the Proposed Action includes all or a portion of sections 8, 9, 15 through 22, 27 through 29, and 32 through 34 of Township 27 North, Range 48 East. Land status consists of several blocks of contiguous claims on lands administered by the

BLM and 246 acres of privately held patented claims. No rights-of-way would be affected by the proposed action.

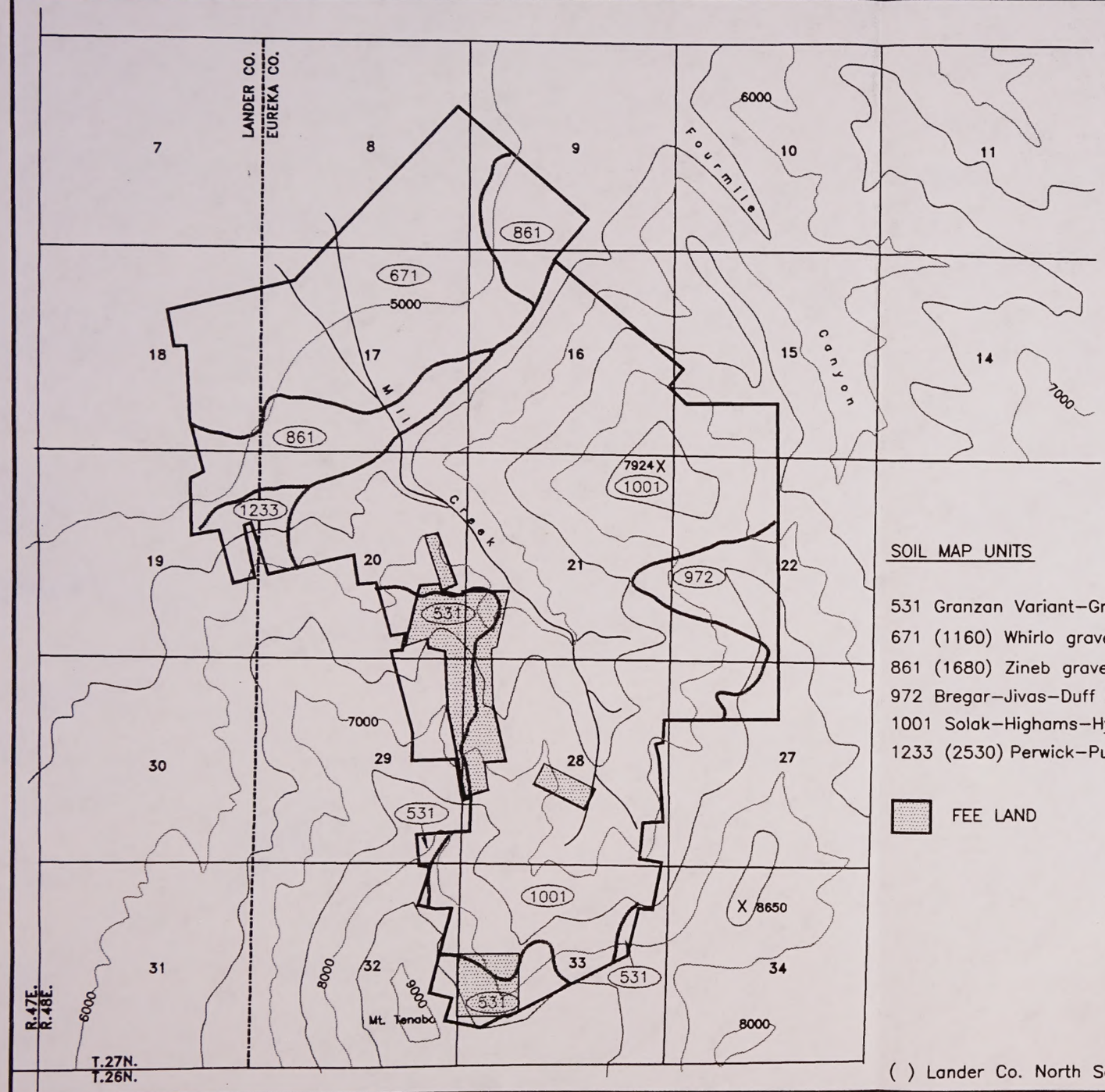
The mouth of Mill Canyon has been closed off by a locked gate for a number of years. SFPM, BLM, and the grazing permittees have a key to that gate; others may gain access upon request. The presence of this gate has had the effect of limiting public access. Given the presence of open shafts and adits in the general area, this limited access has served to ensure public safety.

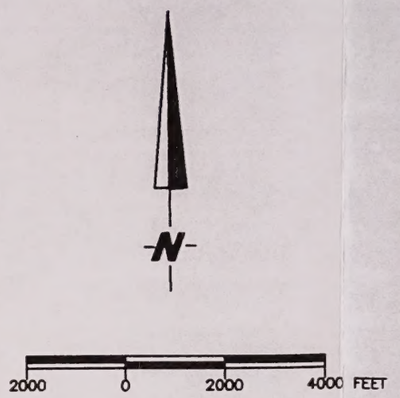
- paleontological resources;
- recreation; and,
- socioeconomics - the project would draw from the existing work force in Winnemucca, Battle Mountain, Carlin and Elko, without any substantial additions to employment. Assuming three to six drill rigs would be operating at any given time, some 14 to 26 people would be present in the project area.

The need to acquire primary data was restricted to a cultural resources inventory. Existing information on soils, upland and riparian vegetation, wildlife, surface and groundwater hydrology and quality, threatened and endangered species, and livestock grazing is contained in a separate baseline report (RCI 1992). Information contained in that report is included by reference into this document; detailed information found in the baseline report is summarized as necessary.

3.1.1 Soils

Soils found in the project area are described in the Soil Conservation Service (SCS) soil survey for the north part of Lander County and published soil survey for Eureka County, Nevada (SCS 1992, SCS 1989). Project area soil mapping is depicted on the Cortez NE orthophotoquad map found within these reports. Six map units are represented in the project area (Figure 3-1), all of which see current use as rangeland and wildlife habitat. The soils and soil associations are described in RCI (1992).





SOIL MAP UNITS

531 Granzan Variant–Granzan–Highams Variant Assoc.
671 (1160) Whirlo gravelly loam, 2 to 8 percent slopes.
861 (1680) Zineb gravelly loam, 2 to 8 percent slopes.
972 Bregar–Jivas–Duff Assoc.
1001 Solak–Highams–Hymas Assoc.
1233 (2530) Perwick–Puett–Tulase Assoc.

FEE LAND

( ) Lander Co. North Soil Survey Map Unit Symbols

MILL CANYON EXPLORATION PROJECT

SOIL MAP UNIT DISTRIBUTION

FIGURE 3–1

3.1.2 Vegetation

Information concerning Mill Canyon area vegetation is derived from Eureka and Lander County (north part) soil surveys, on-site reconnaissance, and vegetation sampling (SCS 1989 and SCS 1992, as reviewed in RCI 1992). Most of the project area supports a sagebrush-bluegrass-needlegrass community. A big sagebrush-snowberry-brome community and a limber pine stand are found at the head of the canyon on the north slope of Mt. Tenabo, and a big sagebrush-Sandberg bluegrass community is found on the pediment (Figure 3-2).

Riparian species grow along the above ground portions of Mill Creek and around some of the project area's springs (Figure 3-3). Pinyon-juniper stands of varying density are scattered throughout the canyon's interior.

A majority of the existing disturbance found in the project area falls within the sagebrush-bluegrass-needlegrass and the high elevation mixed shrub community types. An isolated limber pine stand has also been disturbed by historic mining activities.

3.1.3 Hydrology and Water Quality

Surface hydrology of the Mill Canyon area is characterized by both ephemeral and perennial flows. The upper one-third of the Mill Canyon watershed is steep and only flows in response to direct precipitation or snow melt. The lower two-thirds of the watershed is fed by seeps and springs and is perennial in nature.

Most watersheds in the project area (Figure 3-4) are steep and several have been disturbed by prior mineral exploration related activities. Vegetation density and soil depth are limited in many areas and, as a result, high intensity rainfall common to thundershower activities tends to concentrate quickly in natural and manmade elements of the drainage network. However, much of the Mill Canyon channel is well defined and appears competent under low to moderate flow conditions (see RCI 1992).

MILL CANYON
EXPLORATION PROJECT

VEGETATION COMMUNITY TYPES

LEGEND

- PROJECT BOUNDARY
- RIPARIAN
- SAGEBRUSH/ BLUEGRASS-NEEDLEGRASS
- HIGH ELEVATION MIXED SHRUB
- BIG SAGEBRUSH/ SANDBERG BLUEGRASS
- LIMBER PINE
- PINYON-JUNIPER
- ① VEGETATION TRANSECT LOCATIONS

SOURCE: U.S.G.S. 7.5 MINUTE CORTEZ QUADRANGLE.

SCALE: 1" = 2000'

FIGURE 3-2

MILL CANYON EXPLORATION PROJECT

SPRING LOCATIONS

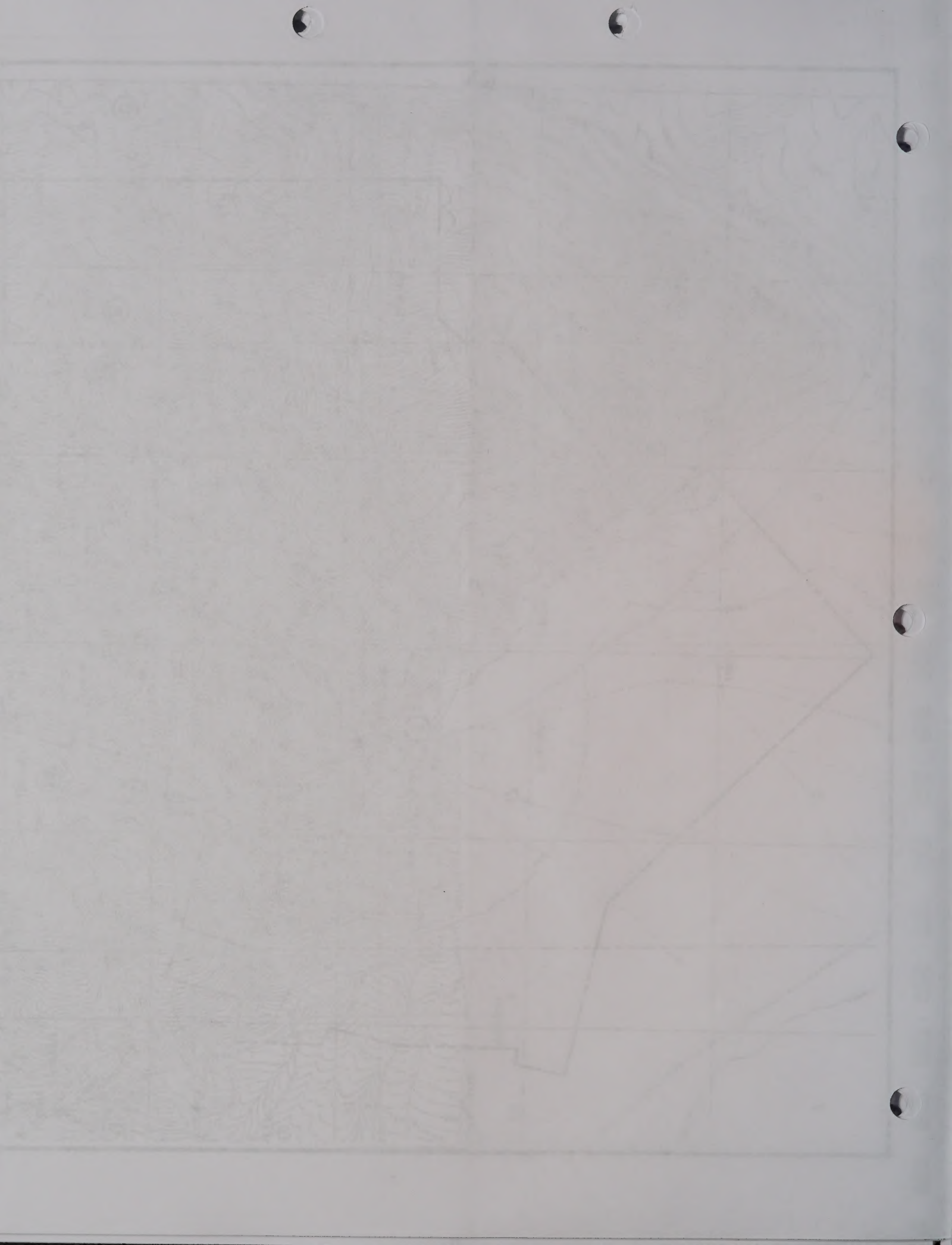
NOTE:

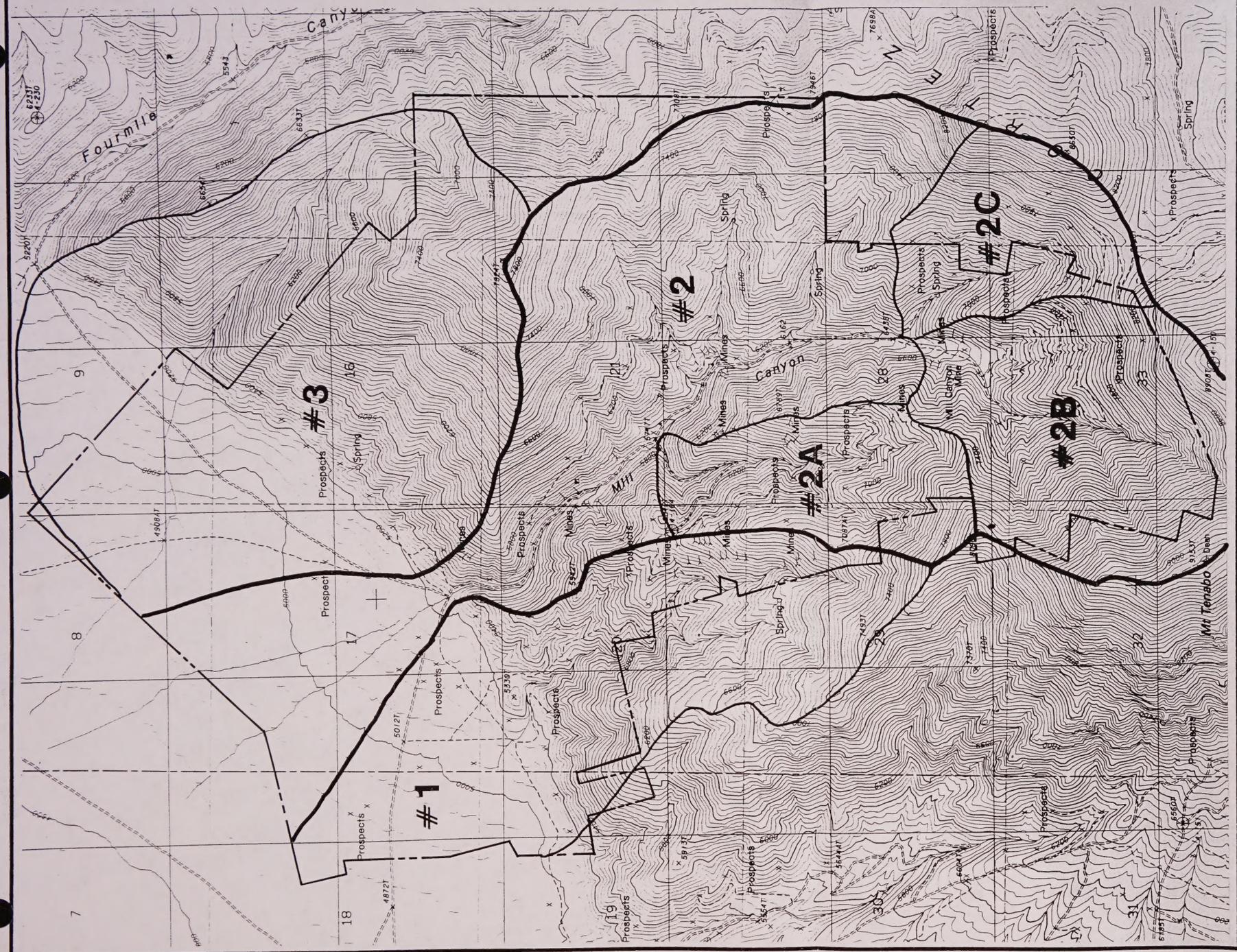
SPRING NOS. 7, 8, 9, & 10 ARE LOCATED BEYOND THE LIMITS OF THIS MAP.

SOURCE: U.S.G.S. 7.5 MINUTE CORTEZ QUADRANGLE

SCALE: 1" = 2000'

FIGURE 3-3





MILL CANYON

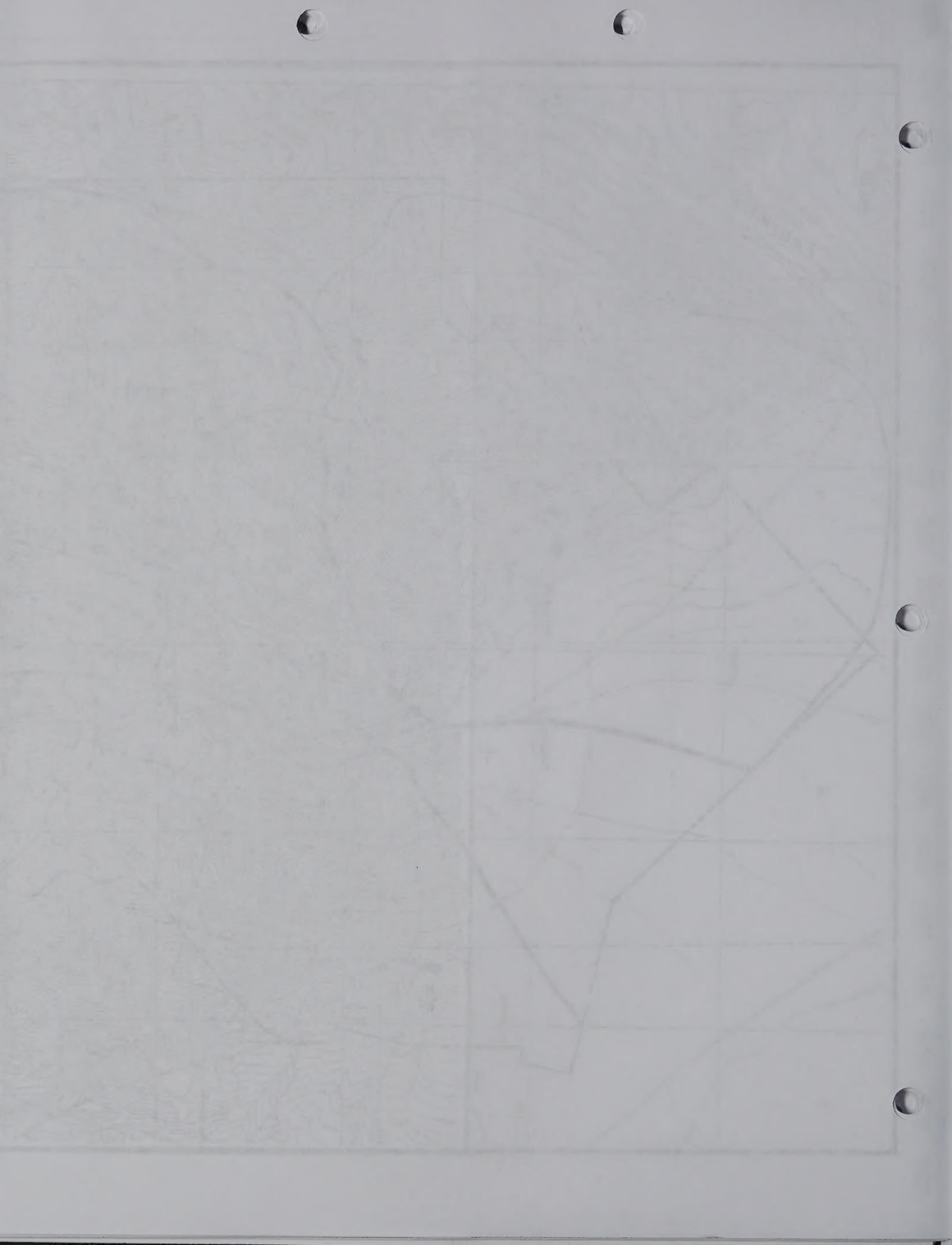
EXPLORATION PROJECT

SELECTED
WATERSHED
LOCATIONS

SOURCE: U.S.G.S. 7.5 MINUTE CORTEZ QUADRANGLE

SCALE: 1" = 2000'

FIGURE 3-4



NDEP establishes use standards for designated waters of the State. To date, Mill Creek has not been evaluated and assigned a specific designation. For purposes of analysis, the use standards assigned to a Class A Water are employed. Available data concerning existing surface water quality in the canyon includes water samples taken from Mill Creek by SFPM in the spring of 1992, and water samples taken from Mill Creek by RCI in the early summer of 1992. Approximate sampling locations are identified on Figure 3-5 and the data are summarized in Table 3-1. All sampled parameters are within recommended limits except arsenic; two samples exceed the standard (0.05 mg/l) slightly (0.065 and 0.072 mg/l). In general, water quality appears typical of streams which have a base flow fed from springs. Such streams tend to be higher in alkalinity and dissolved solids (calcium, sodium, sulfate, etc.). Also, arsenic may occur naturally in the springs feeding Mill Creek, but this has not been verified by sampling.

Six springs are located within the project area and have an average yield of 0.25 to 7.0 gallons per minute (see Figure 3-3). Previous disturbance by other operators in the project area most likely has impacted springs 3 and 13, which are located in the canyon bottom. BLM conductivity data for these springs are provided in the baseline report (RCI 1992); values correspond closely to results from samples drawn directly from Mill Creek.

SFPM has also conducted preliminary investigations in the area of historic period operations, collecting samples of a red/black material (possible tailings) from near the Mill Creek channel. Arsenic levels are not particularly high, suggesting that the material is not a significant source of arsenic. However, cadmium, lead, and possibly mercury levels are elevated in certain samples.

Limited information is available regarding groundwater in the immediate project area. Only flow rate and flow elevation information based on drill hole abandonment records for the area is available (RCI 1992). Groundwater in the Cortez Mountains is limited in quantity due to its occurrence in bedrock joints and fractures. Groundwater in the alluvial fans along the base of the Cortez Mountains is more plentiful. Hydro-Search (1991) has identified an upper and a lower aquifer in the immediate vicinity of the Cortez

MILL CANYON

EXPLORATION PROJECT

SAMPLING
LOCATIONS
FOR
WATER QUALITY

SOURCE: U.S.G.S. 7.5 MINUTE CORTEZ QUADRANGLE

SCALE: 1" = 2000'

FIGURE 3-5

Table 3-1: Mill Creek Water Quality Information

PARAMETER[1]	#1 Creek Cabin	#2 Russel Cabin	#7 Drill Rig Rd.	Upper Mill Crk.	Lower Mill Crk.	Standards
	2/26/92[2]	2/26/92[3]	2/27/92	6/4/92	6/4/92	Class A[2]
pH	--	--	--	7.94	8.09	6.5 - 8.5
Total Cyanide	--	--	<0.005	<0.01	<0.01	<0.2
Alkalinity (as $CaCO_3$)	183	174	--	194	203	±25%
Color (CU)	--	--	--	0.10	0.70	--
Turbidity (NTU)	--	--	--	5-10	5-10	<10
Total Dissolved Solids	306	340	--	288	360	<500/1000
Hardness	--	--	--	240	271	--
Arsenic	--	--	0.065	0.041	0.072	<0.05
Barium	--	--	<0.3	<0.05	<0.05	<1.0
Cadmium	--	--	--	<0.005	<0.005	<0.01
Calcium	62	74	--	68	79	--
Chromium	--	--	<0.02	<0.025	<0.025	<0.05
Chloride	7	8	--	4.2	7.8	<250/400
Copper	--	--	<0.02	<0.025	<0.025	<0.2
Fluoride	0.2	0.2	--	0.17	0.26	<1.0
Iron	--	--	0.04	<0.05	<0.05	<1.0
Lead	--	--	<0.003	0.014	0.0098	<0.05
Magnesium	17	19	--	17	18	--
Manganese	--	--	<0.02	<0.03	<0.03	<0.2
Mercury	--	--	<0.0005	<0.001	<0.001	<0.002
Nitrate	--	--	--	<4	<4	<10
Potassium	2.2	2.4	--	2.1	2.8	--
Selenium	--	--	0.001	<0.005	<0.005	<0.01
Silver	--	--	<0.001	<0.025	<0.025	<0.05
Sodium	12	16	--	9.8	20	--
Sulfate	58	83	--	50	88	<250/500
Zinc	--	--	0.02	<0.05	<0.05	<2.0

[1]Results in mg/l unless otherwise noted.

[2]Mill Creek is not designated a Class A Water by the Nevada Division of Water Resources. Consultation with that agency, however, indicates that application of the beneficial use standards for Class A Waters (NAC445) was preferred in this case.

Gold Mine, the upper aquifer is contained in the uppermost 45 ft of valley fill material. It should be noted, however, that relationships between groundwater levels in the canyon, on the pediment, and on the valley floor are unclear. This is due in part to extensive faulting both along the axis of Mill Canyon and along the Cortez Range front.

Little data regarding groundwater quality is available for the project area. Groundwater quality, as suggested by samples drawn from Mill Creek, is good, though it may be naturally elevated in dissolved solids and, possibly, arsenic. Springs in the upper reaches of Mill Canyon result from infiltration through fractured rock, and water quality may be influenced by the geochemistry of specific formations. Groundwater moving through shallow alluvium along Mill Creek is probably similar in quality to surface waters, especially under low flow conditions. Groundwater in the pediment area may be characteristic of valley fill aquifers associated with Crescent Valley. A study by the U.S. Geological Survey (Zone 1961) reports that water quality in the valley is generally higher near the alluvial fans and becomes increasingly mineralized along the axis of the valley.

Recently, a groundwater remediation plan was prepared to address elevated cyanide, arsenic, and chloride levels associated with the Cortez Gold Mine operation located 1.5 miles west of Mill Canyon. A report by Hydro-Search (1991) suggests that historic mining activities in Mill Canyon may be a source of groundwater contamination in the valley. Water quality data for chloride, arsenic, and cyanide from the well closest to the project area (monitoring well TB-6) and average values from Mill Creek samples are listed in Table 3-2. These data suggest that chloride and cyanide levels at Monitoring Well TB-6 have no connection with events in Mill Creek, but that arsenic levels may be related. As mentioned previously, however, the presence of arsenic may relate to general groundwater conditions within the area.

Table 3-2: Comparison of Groundwater and Surface Water Quality

Parameter	Well TB-6[1]	Mill Creek
Chloride	60 mg/1	7 mg/1
Arsenic	0.066 mg/1	0.059 mg/1
Total Cyanide	unknown	< 0.01 mg/1

[1)] Hydro Search 1991. Remediation Plan, Permit NEV00023.

3.1.4 Water Rights

The Mill Canyon project area is located in the Crescent Valley Hydrographic Area (Number 54) of the Humboldt River Basin as defined by the Nevada Division of Water Resources (NDWR).

Records maintained by the NDWR indicate a number of active water filings are located in or near the project area (Table 3-3). Of these, four are for certificated water rights out of Mill Creek. Permit 7189 (Certificate 1809) is on record at NDWR in the name of Half Circle Cattle Co., Inc., and is for mining, milling and domestic purposes. The point of diversion for this right is near the head of the perennial portion of the creek. The other three rights on the creek are for irrigation purposes. The point of diversion for Permits 17622 and 17623 (Certificates 5646 and 5647) is located about three-quarters of a mile upstream from the canyon mouth, and the point of diversion for Permit 6566 (Certificate 1905) is located on the pediment just outside of the project boundary. Permits 6566 and 17622 are currently in the name of Ted C. Frome and Doyle F. Child, one-half interest each; Permit 17623 is in the name of Half Circle Cattle Co., Inc. It may have been intended that the latter permit also be deeded to Frome and Child; a deed was submitted to NDWR on April 15, 1988, for the assignment of all three permits (17622, 17623 and 6566) to the Dean Ranch.

Table 3-3: Abstract Of Water Rights With Points of Diversion and/or Place of Use Within T. 27 N., R. 48 E.

Basin: Crescent Valley and Pine Valley
Source: Underground and Surface
Status: Proofs, Certificates, and Permits
Date: June 22, 1992

PROOF OR PERMIT [1] (Priority)	CERT. [3]	OWNER OF RECORD	POINT OF DIVERSION ¼	¼	S	T	R	C.F.S. [4]	PERIOD OF USE [5]	USE [6]	PLACE OF USE	UNITS or ACRES	REMARKS
Proof 02045 (Prior to 1900)	---	Half Circle Cattle Co., Inc.	NE	NW	33	27	48	0.5	4/15-12/15	Stockwater	Same as point of diversion	3,000 to 5,000 cattle	Spring No. 5
6566 (9-21-21)	1905	Ted C. Frome and Doyle F. Child. ½ interest each	SE	SW	8	27	48	0.4	4/1-10/31	Irr.	NE¼NW¼ Section 28; T. 28 N., R. 48 E.	40 acres	Mill Creek. 168.77 acre-feet/season. Portion changed by Permit 17622.
7189 (8-4-24)	1809	Half Circle Cattle Co., Inc.	SE	SW	21	27	48	0.184	4/1-10/31	Mining, Milling, and Dom.	SW¼NW¼ Section 21; T. 27 N., R. 48 E.	---	Mill Creek.
7464 (8-5-25)	1726	Half Circle Cattle Co., Inc.	Approximately SE	NE	23	27	48	0.05	3/15-12/15	Stockwater	Approximately SE¼NW¼ Section 23; T. 27 N., R. 48 E.	1,500 cattle, 200 horses	Dean Spring No. 1
7465 (8-5-25)	1727	Half Circle Cattle Co., Inc.	Approximately NE	SW	26	27	48	0.05	3/15-12/15	Stockwater	Same as Point of Diversion	1,500 cattle, 200 horses	Dean Spring No. 2.
7466 (8-5-25)	1728	Half Circle Cattle Co., Inc.	Approximately NE	SE	15	27	48	0.05	3/15-12/15	Stockwater	Same as Point of Diversion	1,500 cattle, 200 horses	Dean Spring No. 3.
7492 (9-4-25)	1729	Half Circle Cattle Co., Inc.	Approximately NE	SE	35	27	48	0.05	3/15-12/15	Stockwater	Same as Point of Diversion	1,500 cattle, 200 horses	Willow Creek Spring
13254 (2-3-50)	3999	Half Circle Cattle Co., Inc.	SE	NE	19	27	48	0.018	1/1-12/31	Stockwater	NW¼NE¼, S½NE¼ Section 19, T. 27 N., R. 48 E.	500 cattle, 60 horses	Unnamed spring

Table 3-3: Abstract Of Water Rights With Points of Diversion and/or Place of Use Within T. 27 N., R. 48 E.

Basin: Crescent Valley and Pine Valley
Source: Underground and Surface
Status: Proofs, Certificates, and Permits
Date: June 22, 1992

PROOF OR PERMIT [1] (Priority)	CERT. [3]	OWNER OF RECORD	POINT OF DIVERSION					C.F.S. [4]	PERIOD OF USE [5]	USE [6]	PLACE OF USE	UNITS or ACRES	REMARKS
			¼	¼	S	T	R						
17622 (9-21-21)	5646	Ted C. Frome and Doyle F. Child. ½ interest each.	NW	SE	17	27	48	1.2	4/1-10/31	Irr.	S½SE¼ Section 21; SW¼SW½ Section 22; T. 28 N., R. 48 E.	120 acres	Mill Creek. 509.23 acre-feet/season. Changes portion of Permit 6566.
17623 (10-29-20)	5647	Half Circle Cattle Co., Inc.	NW	SE	17	27	48	1.6	4/1-10/31	Irr.	NE¼ Section 28; T. 28 N., R. 48 E.	160 acres	Mill Creek. 678 acre-feet/season. Changes Permit 6312
24663 (8-28-68)	7292	Cortez Gold Mines, a Joint Venture	SE	NE	24	27	47	1.1	1/1-12/31	Mining, Milling, and Dom.	Within Sections 13, 24, and 25; T. 27 N., R. 47 E.; and within Sections 18, 19, and 30; T. 27 N., R. 48 E.	---	Underground. At times water commingled with water under Permit 24664.
24664 (8-28-68)	7293	Cortez Gold Mines, a Joint Venture	SE	NE	24	27	47	1.3	1/1-12/31	Mining, Milling, and Dom.	Within Sections 13, 14, and 25; T. 27 N., R. 47 E., and within Sections 18, 19, and 30; T. 27 N., R. 48 E.	---	Underground. At times water commingled with water under Permit 24663.
40302 (1-11-80)	10349	Angelo K. Tsakopoulos	SE	NE	25	27	48	0.0125	1/1-12/31	Stockwater	Same as point of diversion	400 cattle	Holly Polly Spring
45972 (7-23-82)	12294	Angelo K. Tsakopoulos	NW	SE	25	27	48	0.031	1/1-12/31	Stockwater & Dom.	S½ Section 25; T. 27 N., R. 48 E.	1,000 cattle	Unnamed spring

Table 3-3: Abstract Of Water Rights With Points of Diversion and/or Place of Use Within T. 27 N., R. 48 E.

Basin: Crescent Valley and Pine Valley
Source: Underground and Surface
Status: Proofs, Certificates, and Permits
Date: June 22, 1992

PROOF OR PERMIT [1] (Priority)	CERT. [3]	OWNER OF RECORD	POINT OF DIVERSION ¼	¼	S	T	R	C.F.S. [4]	PERIOD OF USE [5]	USE [6]	PLACE OF USE	UNITS or ACRES	REMARKS
46333 (11-12-82)	13197	Cortez Gold Mines	NE	SE	34	27	48	0.22	1/1-12/31	Mining and Dom.	E½ Section 33; Section 34, T. 27 N., R. 48 E; W½ Section 3, E½ Section 4, S½ Section 8, Sections 9 & 16, NE¼ Section 17, E½ Section 21, W½ Section 22, T. 26 N., R. 48 E.	---	Underground (Horse Canyon Water Well). 9.183 mga [7]. Portion changed by Permit 52134.
52134 (11-12-82)	---	Cortez Gold Mines	NE	SW	3	26	48	0.28	1/1-12/31	Mining and Dom.	Same place of use as Permit 46333.	---	Underground. 12.9 mga [7]. Changes a portion of Permit 46333. POC [8] and PBU [9] due 4/23/93.
App [2] 53783 (8-23-89)	---	Cortez Gold Mines	SE	SE	12	27	47	1.11	1/1-12/31	Pollution Control-Mining	W½NW¼ Section 19; T. 27 N., R. 48 E.; E½NE¼ Section 24; T. 27 N., R. 47 E.	---	Underground (Well PB-T) for dewatering.

[1] Proof or Permit - Nevada Division of Water Resources' number. If a "0" precedes the number, it is a proof; if not, it is a permit.
[2] App. - Application number, pending permit issuance or denial by the Nevada Division of Water Resources.
[3] Cert. - Nevada Division of Water Resources' certificate number.
[4] C.F.S. - Cubic feet per second
[5] Period of use - Month/day
[6] Use - Irr - irrigation
Dom - domestic
[7] mga - Million gallons annually
[8] POC - Proof of Completion
[9] PBU - Proof of Beneficial Use

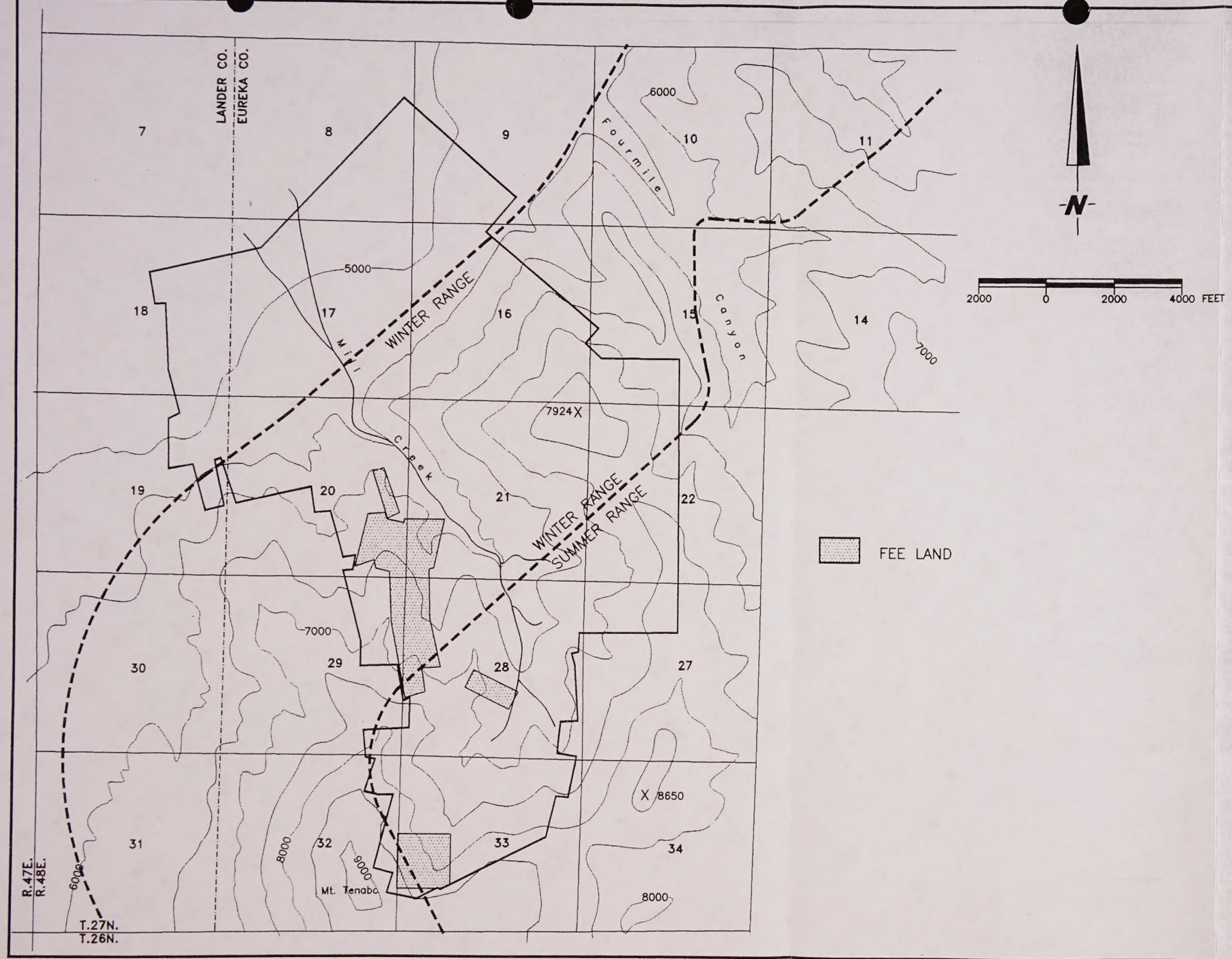
Two other water filings directly affect the project area. Proof 02045 (a claim of vested right) is for water out of a spring located near the head of the canyon. It is for stock watering purposes. Permit 13254 (Certificate 3999) is a stock water right, and is for the water out of an unnamed spring in the east one-half of Section 19, T.27 N., R.48 E. Both of these filings are currently on record at NDWR in the name of Half Circle Cattle Co., Inc.

3.1.5 Wildlife Resources

The project area's three major habitat types (woodlands, shrublands, and riparian areas) provide wildlife with the basic habitat components of food, cover, and water. Species likely to be encountered in the project area are listed in RCI (1992). The woodlands include scattered mountain mahogany, pinyon-juniper, and a limber pine stand, and provide nesting habitat for birds such as mourning dove, and, possibly, winter habitat for blue grouse. Woodlands are also important to mule deer for both thermal and hiding cover. Lower elevation shrublands are important primarily as mule deer winter habitat. The high elevation shrublands are more productive with a diverse composition of palatable perennial grasses, forbs, and shrubs which provide summer mule deer habitat.

Mule deer and chukar are the two identified, year-round management species present in the project area. The project area is in NDOW's mule deer Management Area 14 (Unit 141), of which the Cortez Range is the primary mountain mass. Of the six major mule deer areas in Area 14, the Cortez Range is rated fourth in relative importance. The 1992 population estimate for Area 14 was 6,800 of which the Cortez Range is thought to contribute about 15 percent (Podborny NDOW, pers. comm.). In Mill Canyon, deer use the higher country in the summer and the lower elevations in the winter, depending on snow depth and available open side slopes (Figure 3-6). Movement into and off the range is believed to be limited, occurring primarily across Cortez Canyon onto Bald Mountain at the north end of the Toiyabe mountains (Teske, NDOW, pers. comm.).

Chukar partridge habitat includes canyons with rock outcroppings and scattered brush. Mill Canyon, for the most part, is considered to be low density habitat (Molini, 1976), and as such, may be occupied by overflow from the other habitats during peak population



MILL CANYON

EXPLORATION PROJECT

DEER WINTER AND SUMMER RANGE DISTRIBUTION

FIGURE 3-6

years. However, populations in these areas rarely, if ever, approach high density because the base (habitat and numbers) is limited (Molini, 1976). The live water in Mill Canyon is an important attraction that helps support a small population of chukar within the project area.

Due to the presence of limber pine, and based upon the reports of occasional hunters (Teske, NDOW, pers. comm.), a small population of blue grouse may live in Mill Canyon. If present, the blue grouse would be considered a management species. NDOW has not verified their presence and, therefore, the population size and their breeding, nesting, and summer habitat locations have not been identified. Generally, however, blue grouse are dependant on conifer needles as the mainstay of their winter diet. If a blue grouse population is present in the project area, it would be closely associated with the limber pine stand.

3.1.6 Threatened and Endangered Species

The Nevada Natural Heritage Program (NNHP) and the Nevada Department of Wildlife (NDOW) were contacted to determine if threatened, endangered, or sensitive plant and animal species exist in the project area.

3.1.6.1 Animals

No known threatened or endangered animal species occur within the project vicinity (Appendix A).

Three Level 2 candidate species of animals may occur in the general project vicinity: the loggerhead shrike, the pygmy rabbit, and the ferruginous hawk. While these species are not known to occur within the project area, it is still important to consider the area's potential as habitat for the species. Pygmy rabbits (*Brachylagus idahoensis*) are found throughout the Great Basin, but are most often associated with dense stands of tall sagebrush which provides cover. Deep friable soils are preferred for burrowing. Pygmy

rabbits feed on sagebrush and grasses, especially bluegrass and wheatgrass (Green and Flinders 1980, Weiss and Verts 1984).

The onset of nesting for ferruginous hawks (*Buteo regallis*) occurs during late February to early March. Nests can be situated in trees, cliffs, bluffs, and cut banks, but generally are positioned to overlook broad expanses of open ground. In Nevada, ferruginous hawks prefer to nest in a large tree situated along the pinyon-juniper woodland and desert shrub ecotone, or in a narrow stringer of trees that extends out into the desert shrub. Egg laying begins in April and almost all will have fledged by late June. The birds begin migrating to their winter areas in late September to early October. Ferruginous hawks have rarely been observed to winter in Nevada (Herron et al. 1985 and Perkins and Lindsey n.d.).

Loggerhead shrikes (*Lanius ludovicianus*) are found in open valleys and foothills throughout the Great Basin. They prefer open country with scattered brush or trees on which they can perch. These perches serve as lookout spots from which they can search for prey. In Nevada, loggerhead shrike are found most often in desert areas with scattered shrublands or thin stands of juniper, pinyon-juniper, or mountain mahogany (Ryser 1985 and Alcorn 1988).

3.1.6.2 Plants

Review of NNHP information for the area covered by the Cortez and Buckhorn Mine 7.5' Geological Survey quadrangle maps revealed no known occurrences of any threatened or endangered plant species within the project vicinity (Appendix A).

NNHP files did reveal that a Candidate 3C plant species, Beatley buckwheat, has been reported in the nearby vicinity. A Candidate 3C species is one which was once considered for listing as threatened or endangered, but has since been removed from consideration because it has been "proven to be more abundant or widespread, or less vulnerable, than previously thought" (NNHP 1991).

3.1.7 Livestock Grazing

The project area is located within the South Buckhorn livestock grazing allotment (RCI 1992). The eight listed permittees for the allotment and the number of permitted AUMs by permittee is provided in Table 3-4; all are cow-calf operations permitted to use the allotment from April 16 through November 30. Range improvements are not recorded as being present in the project area and none are planned.

Table 3-4: Preference Status by Permittee

Permittee	Total Preference (AUMs)	Active Preference (AUMs)	Suspended Preference (AUMs)
Maynard Alves	6836	6563	273
Dan Russell	5610	5355	255
Dominek Pieretti	3931	3774	157
Slagowski Ranches	2232	2142	90
Hale Bailey	1312	1260	52
Dewey Dann Estate	1005	965	40
John Harrison	620	595	25
TOTALS	**21,546**	**20,654**	**892**

Access to, and use of the Mill Canyon area by livestock is limited due to topographic factors. Steep canyon slopes see comparatively little use, rather livestock tend to focus attention on the more level canyon bottom. In recent years livestock use in this portion of the valley has been minimal due to drought conditions and pressure from trespass horses.

3.1.8 Cultural Resources

Recent summaries of regional prehistory are provided by James et al. (1981), Smith et al. (1983), Rusco (1982), and Elston (1986). Four adaptive strategies are recognized including the Pre-Archaic (11,500 to 7,000 B.P.), the Early Archaic (7,000 to 4,000 B.P.), the Middle Archaic (4,000 to 1,500 B.P.), and the Late Archaic (1,500 to the time of historic contact). The project area falls within the area used ethnographically by the Western Shoshone (Thomas 1986) who were seasonally transhumant; movement occurred elevationally, moving up the valley edges over the spring and summer, and laterally, from one valley to another. Social organization was structured around the extended family and band settlements which formed for communal activities and often wintered together. Sources on the history of the area are summarized by Vlasich (1981), Bowers and Muessig (1982), and Smith et al. (1983). Major historic themes that affected the local area include trapping, emigrant travels along the Humboldt, precious metal mining, and livestock grazing.

Several archaeological investigations have been conducted within the project area, or extend into the area. Those studies were conducted by Raven and McCabe (1991), Zerga (1991a and 1991b), McCabe (1991, 1992a, 1992b, 1992c, and 1992d), and Delacorte et al. (1991). A combination of Class II and Class III field methods (see BLM 1990) were employed during the surveys. These surveys have resulted in the discovery of 147 cultural resource properties: 12 prehistoric period sites, 69 historic period sites, eight multi-component sites, 18 prehistoric period isolates, and 40 historic period isolates.

3.1.9 Visual Resources

The Mill Canyon project area is within a Class IV Visual Resource Management (VRM) Area. The Class IV VRM objective is to provide for management activities which require major modification of the existing character of the landscape. These activities may dominate the view and be a major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition the basic elements of form, line, color, and texture.

A key observation point was established at the point where Indian Creek Road meets State Highway 306 (Figure 3-7). A Visual Contract Rating Worksheet was completed for this site (Appendix B). Landscape forms are generally triangular or inverted triangular. Natural lines are predominantly steep diagonals with a rolling, horizontal skyline. Shallow diagonals occur on the piedmont slopes. Colors include tans, browns, and grays (soil and rock outcrops) and gray-greens with brighter greens at the canyon mouth (vegetation). Textures vary from smooth and regular to rough and patchy. Previous mineral exploration activities, similar to those proposed, have created horizontal to very shallow diagonal lines and have exposed gray and brown soils.

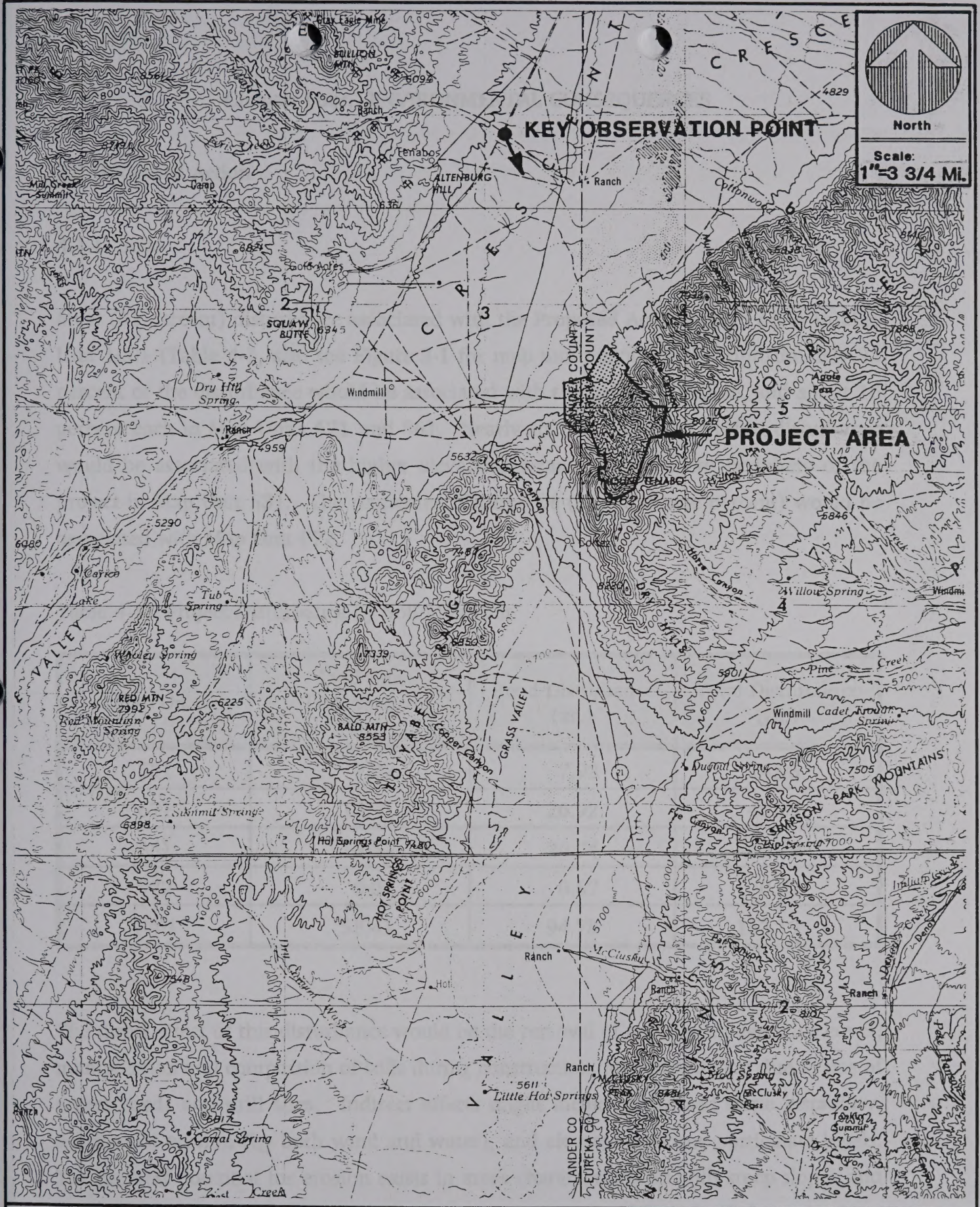
3.1.10 Air Quality

Climatic conditions relating to the project area's air quality are typical of central Nevada and are characterized by low humidity, clear skies, large diurnal variation in temperature, and wind patterns reflecting the westerly direction of the prevailing storm track. Local topographic features serve to produce variants of this pattern.

The project area is located in the non-designated Nevada Intrastate Air Quality Region 147. This region includes Eureka and surrounding counties. The project area is listed as unclassifiable but is expected to be listed as an attainment area in the updated trend report, due sometime in 1993 (Albee, NDEP, pers. comm.). Due to its rural nature, suspended particulates such as PM_{10} are the only background pollutant likely to be in the immediate project area. Information regarding existing hydrocarbon or other pollutant levels are not available, but are presumed to be quite low due to the rural nature of the area.

3.2 No Action Alternative

The description of the affected environment for the No Action alternative would be the same as that for the Proposed Action.


KEY OBSERVATION POINT
PROJECT AREA
North
Scale:
1"=3 3/4 Mi.
Gray Eagle Mine
BULLION MTN
Tenabos
ALTENBURG HILL
Ranch
Mid Creek Summit
Camp
Golf Acres
SQUAW BUTTE
Dry Hill Spring
Windmill
Ranch
Carico Lake
Tub Spring
Whaley Spring
RED MTN
Red Mountain Spring
BALD MTN
Cooper Canyon
Summit Springs
Hot Springs Point
HOT SPRINGS POINT
Ranch
McClusky
Ranch
Ranch
Little Hot Springs
Corral Spring
Creek
LANDER CO
EUREKA CO
Cilfpnwood
Agate Pass
Willow Spring
Pine Creek
Windmill
Cadet Trough Spring
Dugout Spring
Fe Canyon
SHARSON PARK MOUNTAINS
Indian Creek
Ranch
Ranch
Blue Spring
McClusky Pass
Tenabo Summit
Carico
Tenabo
Baker
Horse Canyon
Grass Valley
Coal Canyon
Dry Hills
Pete Hanson
Pete Canyon
Indian Creek
Dry Canyon
Cottonwood Canyon
Cottonwood Creek
Pine Creek
Windmill Canyon
Hot Springs Point
Third Canyon
Hot Springs
Ranch
Ranch
Ranch

KEY OBSERVATION POINT LOCATION

FIGURE 3-7

4.1 Proposed Action

4.1.1 Soils

Most (61 percent) disturbance associated with the Proposed Action would occur in Map Unit 1001 (Table 4-1, also see Figure 3-1 for map unit definitions). Approximately 32 percent of the disturbance would be associated with the pediment region, and about 16 percent each in Map Units 671 and 861. Nearly six percent of the project disturbance would be associated with the higher elevations around the southern periphery of the project in Map Unit 531. The remaining disturbance (less than one percent) would be associated with Map Unit 972.

Table 4-1: Project Disturbance by Soil Map Unit

Map Unit	Drill Site Disturbance (ac.)	Road Disturbance (ac.)	Total Disturbance (ac.)
531	7.02	7.93	14.95
671	13.41	26.92	40.33
861	19.51	20.74	40.26
972	0.0	0.67	0.67
1001	58.41	94.78	153.19

The direct effect of this disturbance would be the removal of protective vegetative cover, manipulation and compaction of soils during construction, and compaction due to use of access roads and drill sites. Indirect effects might include increased slope instability, accelerated erosion (by both wind and water), and elevated airborne particulate levels. The greatest potential for erosion exists in areas characterized by both steep slopes and shallow soils. Soil series that have a higher erosion potential include Highams Variant,

Bregar, Solak, Highams, Hyans, and Puett. These soil series comprise a portion of map units 531, 972 and 1001. Approximately 68 percent of the total project disturbances would occur on these relatively more erosive soil units. Impacts to the soils resource would continue until reclamation success had been achieved.

4.1.2 Vegetation

Approximately one-quarter of the Proposed Action's surface disturbance would occur within the pediment area (Table 4-2). This would affect roughly five percent of the project's big sagebrush-Sandberg bluegrass community. A little over half (55 percent) of the disturbance is proposed in the sagebrush-bluegrass-needlegrass communities of the canyon interior, impacting about four percent of this vegetation type. Approximately 17 percent of the disturbance is proposed in the high elevation mixed shrub communities on the north slopes of Mt. Tenabo, affecting roughly 16 percent of this vegetation type.

Table 4-2: Project Disturbance by Vegetation Type

Vegetation Type	Area (ac.)	Drill Site Disturbance (ac.)	Road Disturbance (ac.)	Total Disturbance (ac.)
Big Sagebrush-Sandberg Bluegrass	1200	25.80	37.38	63.18
Sagebrush-Bluegrass-Needlegrass	3145	50.49	87.10	137.59
Limber Pine	50	2.34	3.10	5.44
High Elevation Mixed Shrub	275	19.86	23.34	43.20

About two percent of the total project disturbance is proposed in the limber pine woodland at the head of the canyon, affecting about 11 percent of this vegetation community. When combined with approximately seven acres of prior surface disturbance

(which would remain after SFPM reclamation activities), approximately one-quarter of this community would have been disturbed. This estimate is based on surface disturbance and does not necessarily reflect the amount of tree removal that may occur. The density of the stand, and the placement of roads and drill sites would dictate the actual amount of tree loss. The amount of tree loss that has occurred to date is unknown.

No project-related disturbances would occur within the Mill Creek riparian area.

The direct effect of project-related disturbance would be the removal of vegetation cover and its associative habitat value. Potential indirect impacts to the vegetation resource may include accelerated sediment deposition in riparian areas associated with Mill Creek and springs. However, impacts to vegetation can be described primarily as short term due to planned reclamation activities. Such reclamation may, in some areas, enhance project area vegetation by increasing desirable species over the long term.

4.1.3 Hydrology and Water Quality

The Proposed Action would involve a maximum of 239.2 acres of surface disturbance distributed across all three watersheds located in the project area (Table 4-3). Watershed 1 would experience a minor increase in surface disturbance (0.3 percent), while Watershed 3 would experience the greatest increase (6.1 percent). Watershed 2 would see a 4.6 percent increase.

Peak flow quantities associated with watersheds 1, 2, and 3 are presented in Table 4-4. Data are provided for three specific time periods: prior to the onset of historic period mining (ca. 1860), prior to the onset of SFPM exploration activities (1990), and at the conclusion of SFPM's proposed project. Flow quantities were estimated based on HEC-1 calculations for a 100-year 24 hour storm event using SCS computation methodologies. Non-SFPM activities (historic and pre-SFPM exploration) caused a six percent increase in peak flows across all three watersheds. This increase occurred incrementally over a 130 year period.

Table 4-3: Project Disturbance by Watershed

WATERSHED 1 (Area: 1,007.3 acres)

	Drill Site Disturbance (ac.)	Roads Disturbance (ac.)	Total Disturbance (ac.)	Percent Disturbed
Pre SFPM	0.0	30.9	30.9	3.1
SFPM	0.9	2.4	3.3	0.3
Total	0.9	33.3	34.2	3.4

WATERSHED 2 (Area: 3,056.2 acres)

Pre SFPM	0.3	79.4	79.7	2.6
SFPM	51.6	89.3	140.9	4.6
Total	51.9	168.7	220.6	7.2

WATERSHED 3 (Area: 1,715.7 acres)

Pre SFPM	19.0	0.0	19.0	1.1
SFPM	45.9	59.1	105.0	6.1
Total	64.9	66.6	124.0	7.2

Table 4-4: Estimated Drainage Quantities for the Mill Canyon Project

Watershed No.	Drainage Area (ac.)	Peak Flows at Project Boundary (cfs)		
		Prior to Historic Mining	Prior to SFPM Exploration	After SFPM Exploration
1	1,004.8	1005	1070	1070
2	3,056.2	2124	2249	2382
2A	364.8	653	690	744
2B	678.4	1230	1322	1569
2C	345.6	615	615	653
3	1,715.2	1547	1640	1820

Impacts to peak flow rates predicted to occur due to SFPM's proposed project are also provided in Table 4-4. HEC-1 modeling indicates that the limited surface disturbance associated with SFPM activities in Watershed 1 would create no measurable increase in storm runoff. Planned activities in Watershed 3 would disturb a higher percentage of the total watershed and, therefore, would result in an 11 percent increase in water runoff. Runoff from Watersheds 1 and 3 flows onto the alluvial fan and not directly into Mill Creek. As discussed in Chapter 3, peak flow analyses were conducted for Watershed 2 in its entirety, and for selected subunits of the watershed (2A, 2B and 2C) which do not encompass all of the watershed (see Figure 3-4). Because of the differing hydrologic characteristics of each subunit, the projected peak flows also do not correlate with the estimated outflow values for Watershed 2 as a composite. When viewed as a single unit, Watershed 2 would experience a six percent increase in peak runoff quantities as a result of the proposed project. Project-related disturbance would occur in all three subunits with peak flows increasing by 8, 19, and 6 percent in subunits 2A, 2B, and 2C, respectively. Although peak flows in the vicinity of historic structures and tailings along Mill Creek would increase, that increase is not expected to cause a risk to those structures or tailings.

These impacts to surface hydrology may be considered both minor and short term due to SFPM's planned reclamation activities. Since hydrologic characteristics of the watersheds are directly affected by the existence or absence of vegetation, reclamation activities may return runoff to pre-project volumes over the long term. Impacts to water quality could occur if standard operating procedures identified in the POO were not followed adequately. Of particular concern would be activities that increased sediment loading in Mill Creek or nearby springs, or that prompted groundwater degradation due to improper drill hole closure.

Preliminary sampling by SFPM suggests that tailing deposits dating to the historic period are present in the project area that exhibit elevated concentrations of selected heavy metals. It is reasonable to assume that some of this material passed along the lower reaches of Mill Creek and was redeposited in the stream channel or on the alluvial fan below the mouth of Mill Canyon. Field investigations conducted by SFPM indicate that these tailings are readily identifiable and that they tend to be located in small deposits

along older (pre-diversion) channels. The disturbance of these deposits may allow any heavy metals present to mobilize during runoff events. Mill Creek is a source of recharge to groundwater in Crescent Valley and disturbance that might increase contaminants in surface water may have the potential to affect groundwater.

4.1.4 Water Rights

Water filings and subsequent use of permitted waters for project activities may impact active local water rights. Any such impacts would be considered by the State Engineer prior to acting upon new water filings. The estimated yield of the affected hydrologic basin(s) would be compared to existing allocations. Successful compliance with NDWR requirements would constitute adequate mitigation of project-related impacts on water rights.

4.1.5 Wildlife Resources

Impacts to nongame, predator, and possibly game species may occur, but most habitats represented in the project area are large enough and the terrain sufficiently varied to accommodate any wildlife dispersal that may occur. Disturbance to the high elevation mixed shrub community and the limber pine habitats would have a greater impact on any resident species due to the limited distribution of these areas (see Table 4-2).

Exploratory work on slopes overlooking the pediment could cause mule deer to use drainages other than Mill Canyon during the winter, depending upon the intensity of human interference and disturbance. The fawning period during April and May represents one of the more sensitive and critical time frames for pregnant does. The highest quality fawning habitat in the project area occurs in the high elevation mixed shrub type and the limber pine stand where moisture conditions result in dense vegetation cover. Mineral exploration activities in these habitats during the fawning period would disrupt and displace deer fawning activities. However, exploration during the fall mule deer breeding season should not result in any significant disturbance due to the limited magnitude of that work when compared to the total breeding area available.

A population of blue grouse may reside within the project area. If present, then disturbances in the limber pine stand and the surrounding high elevation mixed shrub type would reduce the area's winter carrying capacity for blue grouse.

Only a slight habitat loss to wildlife such as raptors, passerine birds, rodents, reptiles, chukar partridge, dove, or sage grouse is expected. Ground dwelling rodents occupying sites subject to disturbance could be displaced or killed. Loss of wildlife (other than rodents) due to vehicle travel is not anticipated due to the slower speed required in the steep terrain of the upper canyon. Losses may occur on routes leading to the project area due to potentially greater vehicular speeds.

Wildlife may be impacted by project-related noise emissions. Construction and drilling related noise would occur throughout the work day, while traffic related noise would be most pronounced at the beginning and the end of each work day. Blasting would occur toward the end of the work day. Noise intensity would depend on the number and type of units operating at any given time and the nature of the terrain separating noise sources from the receptor.

4.1.6 Threatened and Endangered Species

4.1.6.1 Animals

Threatened, endangered, or candidate animal species are not present in the project area. However, three candidate species (the loggerhead shrike, the pygmy rabbit, and the ferruginous hawk) have the potential to be present in the general project vicinity. Portions of the project area could represent nesting and hunting habitat for the loggerhead shrike and hunting habitat for the ferruginous hawk, although these species have not been documented to occur in the vicinity. Removal of 239.2 acres of habitat would not affect loggerhead shrike or ferruginous hawk populations in the area, as there would be abundant similar habitat in surrounding, undisturbed areas. The project area does not appear to represent suitable habitat for the pygmy rabbit. Therefore, the Proposed Action would have no effect on any of the identified candidate species.

4.1.6.2 Plants

No threatened, endangered, or candidate plant or animal species are present in the project area.

4.1.7 Livestock Grazing

The Proposed Action would involve a maximum of 239.2 acres of surface disturbance. Based on an average carrying capacity of 29 acres per AUM, 8.2 AUMs of forage loss would occur. This forage loss represents approximately enough feed to support one cow or cow/calf pair during the seven month permitted season of use on the South Buckhorn allotment. Recent permitted livestock use in the area has been limited due to drought conditions (especially on the pediment), pressure from trespass horses, and the terrain and limited access within in the canyon. No range improvements would be affected by this project. However, impacts to rangelands can be described as short term due to planned reclamation activities. Therefore, no reduction in the permittee's allotted AUM would be necessary. Such reclamation may also enhance project area vegetation by increasing desirable species over the long term.

4.1.8 Cultural Resources

Cultural resources surveys have been conducted which address some 2,530 acres, or 54 percent, of the 4,670 acre project area. All activities proposed as part of the POO would be located in areas previously surveyed. These surveys have resulted in the discovery of 147 cultural resource properties. The identification of which properties are eligible to the National Register of Historic Places has yet to be accomplished, since adequate contextual information for the project area does not yet exist.

Proposed disturbance areas and cultural resource locations were reviewed. That review indicates that 59 proposed drill sites would be located within or extend into identified cultural resources. An additional 113 proposed drill sites cannot be reached without encountering a cultural resource conflict along either a proposed access road or at a

proposed drill site. A map showing the location of all cultural resource conflicts is on file with the BLM and SFPM.

The presence of a locked gate at the mouth of Mill Canyon and the proposed placement of a second locked gate near the head of the canyon represent beneficial effects as viewed from the perspective of cultural resources. These gates limit public access, minimizing the potential for unauthorized artifact collection and the possible destruction of buildings and structures present.

4.1.9 Visual Resources

The Visual Contrast Rating Worksheet was completed to determine the visual impact of the proposed action (Appendix B). Short-term impacts to line and color would result from the proposed action. The horizontal and shallow diagonal lines from the drill roads would create moderate line contrasts with the characteristic landscape. Moderate color contrasts would result from the vegetation removal associated with road and drill pad construction. Form and texture contrasts would be weak to none.

Successful reclamation of the exploration roads would reduce the long-term visual impacts of the proposed action. The Class IV VRM objectives would be met.

4.1.10 Air Quality

Surface disturbance would exceed 20 acres and, as a result, fugitive dust would be a source by definition (NAC 445.705 subsection 1.h). The generation of particulates would result from blasting and other road and drill site construction activities, drilling, vehicular traffic on unpaved roads, and wind erosion of disturbed surfaces. Fugitive dust generation due to ground disturbance would continue at some reduced level until revegetation success is achieved.

4.2 No Action Alternative

The BLM would not approve SFPM's POO to conduct mineral exploration. Current agency management practices would continue. Implementation of the No Action alternative would result in the avoidance of all identified, project-specific resource conflicts. However, the No Action alternative would not accomplish the identified project need.

4.3 Mitigation

Implementation of standard operation and reclamation procedures identified in the POO adequately address the possible spread of noxious weeds and impacts to soils, threatened and endangered species, livestock grazing, visual resources, and air quality. Impacts to these resource would be minor in nature and would be short in duration, existing until reclamation success has been achieved. Only those resource issues that require mitigation are discussed below.

4.3.1 Vegetation

SFPM would, to the extent practicable, limit damage to or removal of limber pine trees. If damage to or removal of such a tree is proposed by SFPM, it would not occur without prior notification of the BLM authorized officer. SFPM may damage or remove a tree only if the BLM authorized officer concurs with the proposed action. The BLM authorized officer would issue a decision within five calendar days of notification (weather permitting) by SFPM that such action was proposed. Factors considered by the BLM authorized officer in reaching a decision shall include conformance with the Environmental Assessment, and the potential of the proposed action to cause undue or unnecessary degradation.

4.3.2 Surface and Groundwater Hydrology

SFPM would develop and implement a surface water quality monitoring program. The purpose of that program would be to monitor impacts of the proposed development on the quality of surface waters flowing in Mill Canyon. Also, to the fullest extent possible, SFPM would not disturb areas containing visually identifiable tailing deposits during the construction of drill sites or access roads. If SFPM elects to construct a road or drill site in an area containing such deposits, it would first relocate or remove the deposits in accordance with any applicable laws, and in cooperation with the BLM and NDEP.

4.3.3 Cultural Resources

An impact may occur to cultural resources if 172 specific drill sites or their associated access roads were authorized. The National Register eligibility of those resources has yet to be determined. BLM authorization to construct these drill sites and/or segments of access roads that may impact an identified cultural resource would not occur until one of the following conditions has been met:

- A historical context has been prepared and the National Register eligibility of the cultural resource in question has been determined. If the cultural resource is eligible, SFPM would either relocate the drill site or access road, or comply with all appropriate regulations prior to impacting the site. If the cultural resource is not eligible, then SFPM would be authorized to proceed, assuming no other resource constraints affect that decision.

- The drill site and/or access road has been relocated and it has been demonstrated to the BLM that no resource conflict exists.

Cultural resources within the project area or in other portions of Mill Canyon may be impacted indirectly due to increased human presence and increased awareness of historic resources. SFPM would implement a means of monitoring indirect impacts to selected resources in Mill Canyon. Information on baseline conditions would be developed and a monitoring schedule established. SFPM would report to the BLM any observed acts of cultural resource vandalism, and the apparent results of such vandalism.

4.3.4 Wildlife

Effect of the Proposed Action on wildlife would be minor in nature and would exist for only a short term. SFPM project personnel would report to the BLM any blue grouse sightings in the project area.

4.4 Residual Impacts

A residual impact is an impact, or some portion of an impact, that would remain upon completion of the Proposed Action and implementation of all identified mitigation measures. Residual impacts likely to be associated with the Proposed Action include the following:

- Even after a detailed archaeological field study, inadvertent damage to undiscovered prehistoric and historic period sites may occur.
- For the term of the project, mineral exploration would be a prominent land use in the area. A residual impact would result to the extent that this causes displacement of other land uses which cannot be accommodated or relocated in a coordinated manner.

4.5 Cumulative Impacts

A cumulative impact may be described as the impact resulting from the incremental impact of a proposed action when added to other past, present, and reasonably foreseeable actions. By definition, if an impact to a specific resource is not identified, then it cannot contribute to a cumulative impact.

Reasonable foreseeable actions in the Mill Canyon vicinity may include additional exploration projects and an expansion of extraction activities. Some amendment of SFPM's exploration program is to be expected. Disturbance associated with reasonably foreseeable actions cannot be known at present. It is conceivable, but unlikely, that exploration activities by some other mining company would occur in Mill Canyon during the period of consideration. Also, because the result of exploration activities cannot be foreseen, the

likelihood of mineral extraction activities in Mill Canyon cannot be determined. Thus, exploration beyond that proposed by SFPM and mineral extraction in Mill Canyon are not considered reasonably foreseeable. The period over which cumulative impacts are considered is the expected life of the project, including both exploration (five years) and revegetation (estimated at four years following completion of reshaping and seeding).

Impacts to soils, vegetation, livestock grazing, visual resources, and air resources are considered incremental, minor in magnitude, and of short duration. A collective consideration of cumulative resource impacts is appropriate since they all relate to surface disturbance. An estimated 129.5 acres of surface disturbance existed within the project area prior to the inception of SFPM activities (RCI 1992). The proposed SFPM project would add an additional 239.2 acres of disturbance, for a total disturbance of 368.7 acres. Outside of Mill Canyon, active mineral extraction facilities at the Horse Canyon, Cortez, and Gold Acres mines represent concentrated areas of surface disturbance. Also, disturbance is associated with ongoing mineral exploration projects in the southern Crescent Valley/Cortez Mountains region. Some existing disturbance is being reclaimed by past operators and all SFPM disturbance would be reclaimed at the end of the project. By the end of the cumulative assessment period, reclamation success in most if not all these areas would have been achieved. Thus, while the Proposed Action could contribute to local surface disturbance related impacts, it should not contribute to any long-term, local or regional cumulative impact to soils, vegetation, livestock grazing, visual resources, or air resources.

4.6 Monitoring

Mitigation measures identified in Section 4.3 includes two monitoring programs that would be conducted in conjunction with the Proposed Action: a surface water quality monitoring program along Mill Canyon, and a monitoring program to detect indirect impacts to cultural resources in the project area.

In addition, SFPM would submit a project map to the BLM on completion of the project which depicts the location and status of all project-related disturbance. In addition, the BLM would take the following actions.

- Prior to approval of the POO, the BLM would supply SFPM any stipulations affecting project development, operation, and closure. Agency monitoring measures would be discussed to ensure compliance with proposed actions and mitigation measures.

- The BLM would make initial and periodic inspections of the project. Should a situation develop that was not anticipated in this document, specific actions would be developed to correct deficiencies. A record of field compliance would be made by the BLM on each visit and documented to the project file. A copy of that record would be provided to SFPM.

- Post-project reclamation monitoring associated with the Proposed Action would be determined by the BLM and SFPM. In general, monitoring would consist of periodic surveys conducted by the BLM. These surveys would determine site stability and success. The survey methods would be coordinated between BLM and SFPM.

The BLM would institute all monitoring programs necessary to ensure compliance with agreed upon mitigation measures.

Chapter Five. CONSULTATION AND COORDINATION

5.1 List of Preparers

BUREAU OF LAND MANAGEMENT, ELKO DISTRICT

Steve Wells, Reclamation and Lead Preparer
Gary Back, Wildlife
Carol Marchio, Hydrology
John Barss, Socioeconomies
Lauren Mermejo, Environmental Coordinator
Dan Fowler, Archaeology and Paleontology
Rich Young, Hazmat
Ken Nelson, Lands
Evelyn Treiman, Recreation and VRM
Roy Price, Threatened, Endangered, and Candidate Species
Nick Reiger, Minerals
Tom Warren, Range and Vegetation

RESOURCE CONCEPTS, INC.

Sheila Anderson, Wildlife
Leslie Burnside, Livestock Grazing and Soils
Andrew List, Air Resources, Land Use
Marvin Tebeau, Hydrology and Water Quality
Jo Watson, Vegetation, T & E
Fred Wright, Wildlife
Charles Zeier, Cultural Resources, Project Manager

ARCHAEOLOGICAL RESEARCH SERVICES, INC.

Thomas Burke, Principal Investigator
Alan McCabe, Project Director

5.2 Persons, Groups, or Agencies Consulted

U.S. DEPARTMENT OF THE INTERIOR - FISH AND WILDLIFE SERVICE

Pat Coffin, Supervising Biologist - Fish (NDOW retired)

U.S. DEPARTMENT OF THE INTERIOR - GEOLOGICAL SURVEY

Theresa Fogelson, Public Information Officer

U.S. DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

David W. Denny, Soil Survey Project Leader
Craig A. Plummer, Range Conservationist

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Jim Lott, Meteorologist

STATE OF NEVADA
Department of Wildlife
Larry Barngrover, Regional Manager - Elko
Peter Bradley, Biologist, Non-game - Elko
Duane Erickson, Biologist, Habitat - Elko
Gary Herron, Staff Biologist, Game - Reno
Mike Hess, Staff Biologist, Game - Reno
Michael Podborny, Biologist - Eureka
San Juan Stiver, Staff Biologist, Game - Reno
Larry Teske, Biologist - Battle Mountain

Department of Conservation and Natural Resources
Division of Environmental Protection
Air Quality Branch
Charlene Albee, Environmental Mgmt. Specialist
Steve Hoelscher, Environmental Mgmt. Specialist
Mining Regulation Branch
Kathy Sertic, Environmental Mgmt. Specialist
Doug Zimmerman, Branch Supervisor
Permits and Compliance Branch
Gay McCleary, Branch Supervisor
Water Quality Branch
Jim Cooper, Branch Supervisor

Division of Water Planning
Randy Pahl, Hydraulic Engineer

Natural Heritage Program
Kevin Cooper, Data Manager

Eureka County
Public Works Department
Lenny Fiorenzi, Director of Public Works

SANTA FE PACIFIC MINING, INC.
Ed Falk, Geology
Jim Smithson, Permitting
John Young, General Project Direction

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Appendix A

Correspondence Regarding Threatened and Endangered Species

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Correspondence Regarding Threatened and Endangered Species

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Correspondence Regarding Threatened and Endangered Species

The Nevada Natural Heritage Program

123 West Nye Lane, Room 168 - Carson City, Nevada 89710
(702) 687-4245

24 April 1992

Jo Watson
Resource Concepts
340 N. Minnesota
Carson City, NV 89703

Dear Jo:

We are happy to comply with your request for information on the sensitive plant and animal species on or near the Mill Canyon project area. We searched our data base and maps for the following quads:

Cortez Buckhorn Mine

Sensitive species that are known to occur in the project areas are listed on the enclosed printout. Various raptors may also occur throughout the project area. For more complete information on raptors, please contact Gary Herron, Nevada Dept. of Wildlife, at (702) 688-1500.

Please note that our data are dependent on the research and observations of many individuals and organizations, and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

For more specific habitat information on the species, you may contact our Zoologist, Glenn Clemmer, or our Botanist, Jim Morefield at (702) 687-4245.

Thank you for checking with our program, If we can be of further assistance please give us a call.

Sincerely,

Kevin Cooper

Kevin Cooper
Data Manager

SENSITIVE PLANT AND ANIMAL SPECIES ON 7.5 USGS QUADS
Compiled by the Nevada Natural Heritage Program
24 April 1992

CORTEZ 7.5 USGS QUAD

SCIENTIFIC NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	NNHPS STATUS	TOWNSHIP RANGE	CENTRUM SECTION	LAT.	LONG.	LAST OBSERVED
Eriogonum beatleyae	BEATLEY BUCKWHEAT	3C		D	026N048E	03	400137N	1162537W	1937-07-11

Appendix B
Visual Contrast Rating Worksheet

BLM Library
Denver Federal Center
Bldg. 50, [illegible]321
P.O. Box 25047
Denver, CO 80225

Appendix B

Visual Contrast Rating Worksheet

BLM Library
Denver Federal Center
Bldg. 50, D-132A
P.O. Box 25047
Denver, CO 80225

Form 8400-4
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

6-30-92

District: ELKO

Resource Area: ELKO

Activity (program): MINERALS EXPLORATION

SECTION A. PROJECT INFORMATION

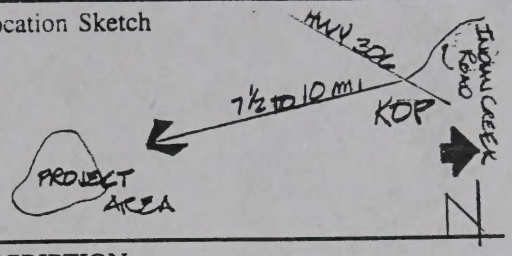
1. Project Name: MILL CANYON

2. Key Observation Point: 1

3. VRM Class: IV

4. Location
Township 27N
Range 48E
Section 8,9,15,16, 17,18,19,20,21,22, 28,29,32,33

5. Location Sketch



SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	FOREGROUND: FLAT/SLOPING MIDDLEGROUND: FLAT/SLOPING BACKGROUND: RUGGED/STEEP	F: SHORT, ROUNDED, LITTLE VARIETY M: AMORPHOROUS B: INDISTINCT	F: FLAT, HORIZONTAL M: " B: "
LINE	F: SIMPLE, HORIZONTAL M: " " B: ANGULAR, IRREGULAR	F: DISTINCT M: SUBTLE B: INDISTINCT	F: BOLD, STRAIGHT M: " B: STRAIGHT, CONVERGING
COLOR	F: SUBTLE TANS AND GRAY GREENS M: " " B: SUBTLE GRAYS, GRAY GREENS, TAN	F: GOLD AND GRAY GREEN M: " B: SHADES OF GRAY AND GREEN	F: TAN, BEIGE M: " B: "
TEXTURE	F: MOTTLED M: SMOOTH B: PATCHY	F: ROUGH, MOTTLED M: SMOOTH, CONTINUOUS B: SMOOTH, DISCONTINUOUS	F: DIRECTIONAL M: " B: "

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	BACKGROUND: NO CHANGE	B: IRREGULAR PATCHY	B: NO CHANGE
LINE	B: HARD, IRREGULAR	B: IRREGULAR, HARD	B: NO CHANGE
COLOR	B: CONTRASTING GRAY/TAN	B: SUBTLE	B: NO CHANGE
TEXTURE	B: SUBTLE	B: SMOOTH, DISCONTINUOUS, PATCHY	B: NO CHANGE

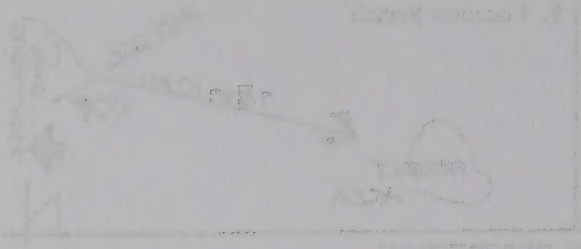
SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) Strong	Moderate	Weak	None	VEGETATION (2) Strong	Moderate	Weak	None	STRUCTURES (3) Strong	Moderate	Weak	None
Form				X			X					X
Line		X				X						X
Color		X				X						X
Texture			X			X						X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended ☐ Yes ☒ No (Explain on reverse side)

Evaluator's Names: BETH WILHELM

Date: 6/30/92